# STUDIES ON THE AVIAN CESTODE PARASITES OF BUNDELKHAND REGION

Thesis submitted to the
Bundelkhand University
For the Degree
Of
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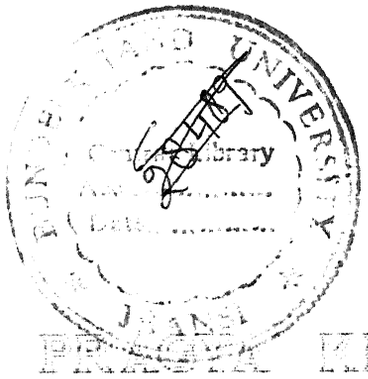
in
Zoology




BY

PRAGYA KHARE
M.Sc.
DEPARTMENT OF ZOOLOGY
BIPIN BIHARI (P.G.) COLLEGE
JHANSI (U.P.)

1996

WORK IS DEDICATED

IN THE MEMORY OF

MY BELOVED

GRANT FATHER

# C O N T E N T S

# CERTIFICATE

Dr. A.K.Srivastav
M.Sc.,D.Phil.,F.A.Z.,F.E.S.,
F.Z.S.I., F.I.A.E.S.
Executive Editor Flora
& Fauna
Reader in Zoology
Bipin Bihari Post Graduate
College , Jhansi- 284003
(India)

Tel: 0517-445424(R.)
"Sukh Sadan"
F-3, Surya Puram
Sipri Jhansi-284003
( INDIA )

## SUPERVISOR'S CERTIFICATE

This is to certify that the thesis entitled "STUDIES ON THE AVIAN CESTODE PARASITES OF BUNDELKHAND REGION" embodies theoriginal research work of Km. Pragya Khare, M.Sc.(Zoology), who worked under the guidance of undersigned during 1994-1996 in the Department of Zoology, Bipin Bihari Post Graduate College, Jhansi. The thesis has not been submitted for any degree to any other university.

Srivastav

(Dr. A.K.Srivastav)

Jhansi
Date : 20.11.96

# PART - A

# A C K N O W L E D G E M E N T S

Through this thesis every attempt has been made to extend to study on cestodes of Bundelkhand zoo-geographical zone by the author's topic." Morphology & Taxonomy of Cestode Parasites". As one of the member of the carvan which is carrying forward the precious burden of the knowledge gift of goddess Saraswati in this field from basest to upward.

The present work has been successfully carried out and completed on the lines to awake. arise and stop not, till the goal is achieved in the P.G. Department of zoology,Bipin Bihari(P.G.) college Jhansi under able and ideal Professor Dr. A.K. Srivastav M.Sc.,D.Phil.,F.A.Z..F.H.S..F.Z.S.I..Who has tendency towards the highest conceivable perfection and search after the best and the imaginative treatment of the subject, by inspiring & stimulating the students in the department.The author is fortunate that she worked under the guidance of such a supervisor. The author is thankful to him Dr.A.K.Shrivastav for his matured guidance,timely intervention and valuable pices of advice due to which author could remain confined to exact conception of aim. object and reap of the subject.Indefatiguable interest displayed by him, has left indelibe impression in deep recess of mind of the author.The spirit there of, shall never extinct.It

shall always beckon the author to remain unwavered, during a long period of her career a head.

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and has established his position of real scholar ship, Dr. V.C. Srivastava, C.M.P. College, Allahabad, and Dr.A.K.Chopra, Head of the Department of zoology, Gurukulkangri, University Haridwar, during their short visits, blessed to the author, thereby, the author could learn what she did not know and confirm what she knew, on account of this aspect of vital importance, the author could not astray even by an iota and pays heartly thanks.

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the said carvan by taking pains in the subject.

At the last but not the least every achievement is revolved on the pivot which is provided & guarded by the parents of every student. & Scholar for that she is fortunate. The author has no words to express her heartiest reverence to her grand father, grand mother, parents Smt S. Khare & Sri R.N. Khare, that who dagged persistence and tereless persiverance contributed a lot to achieve this success. The co-operation extended by her other family members, brothers Mr.Atul Khare, Mr.Anoop Khare, and sister Km. Amita Khare, is worth considerable.

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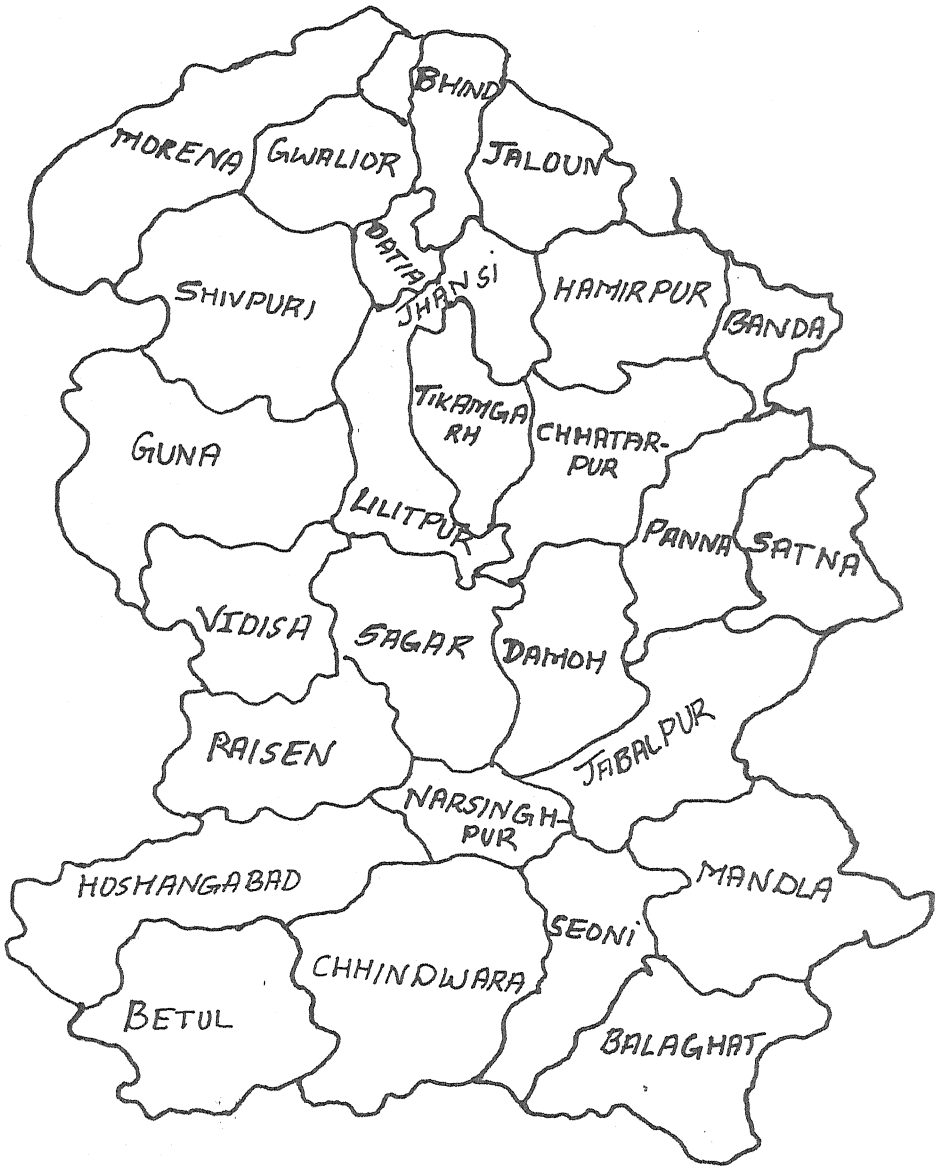
The author with great sense of gratitude, concludes her thesis by recollecting initial lines of her supervisor Dr.A.K.Srivastav, that human individual is not a mere object amoung objects, a thing amoung things, without meaning, for that the author shall remain thankful.




Map of Bundelkhand Region

# I N T R O D U C T I O N

A number of domestic and wild species of birds constitute highly nutritive food for human beings. The relationship of human beings with birds had developed enjoyment of birds as food and sport. Thus they form a significant economically important group. These birds are invariably infected by a large number of Helminths, viz. cestode, trematode and a nematode parasites which cause deterioration in their health and hence their nutritive and market value is affected. The curiosity of the author to know about the helminth parasites found in such birds lead him to undertake the present project. In the present thesis the author has restricted herself to the morphogical and taxonomical studies of the cestode parasites found in the birds.

Birds were collected from different regions of bundelkhand. Bundelkhand region includes Banda, Bhind, Chhatarpur, Datia, Damoh, Gwalior, Guna, Hamirpur, Jabalpur, Jalaun, Jhansi, Lalitpur, Morena, Narsinghpur, Panna, Raisen, Sagar, Shivpuri, Satna, Tikamgarh and Vidisha districts of Uttar Pradesh and Madhya Pradesh states. The main and important rivers of this region are Betwa, Chambal, Dhasan, Ken, Narbada and Tauns.

Bundelkhand region shows nearly 100 cm

rainfall per year. Though it may be quite hot in june and mercury touches 48°c but the rainy and winter seasons are very-very pleasant. In winter the maximum temperature is around 25°c and the maximum 5°c.

Geographically the bundelkhand region ranges from 24.11 to 26.27 north latitude and 78.10 to 81.34 mid of the eastlongitude.

The present thesis deals with some of the interesting cestodes obtained during the survey which included formation of new subfamily podicelliinae n.subfam., and the discription of eleven new genera, thirteen new species and redescription of one old species.

The new subfamily, new genera and new species reported in the thesis belong to the family Anoplocephalidae Cholodkovsky, 1902; Davaineidae Fuhrmann, 1907; Dilepididae Railliet et Henry, 1909; Hymenolepididae Railliet et Henry, 1909; Amabilliidae Ransom, 1909; Diplopostidae poche, 1926; Dioecocestidae southwell, 1930 of order Cyclophyllidea Ben in Braun, 1900.

A brief review relating to the cestode genera described in the thesis is given below :-

The Genus *Killigrewia* Meggitt, 1927 contains twelve species from the whole world. The first report of the genus pertains to *Killigrewia delafondi*

Railliet. 1892 from Columba domestica in France. Out of the nine oriental species six have been reported from Indian sub continent. The first report of the genus from Indian sub continent is that of Meggitt. 1927. Other workers who have contributed to the knowledge of this genus from Indian sub continent are Sharma. 1943; Johri. 1962; Srivastava and Capoor. 1965; Duggal and Gupta. 1987 and Srivastava and Srivastava. 1984.

The genus Ophryocotylus Srivastav et Capoor. 1982 contains single species. Ophryocotylus dinopii in Dinopium benghalense, which has been reported from the Indian sub continent and the oriential region. The present new speices represent the first report of the genus from the Bundelkhand region.

The genus Ophryocotyloides Fuhrmann. 1920 contains fifteen species from the whole world. The first report of the genus is Ophryocotyloides pinguis ( Fuhramnn. 1904) in Bucorax abyssinicus and Bucorvus leadbeateri from Africa. Out of the various species of the genus thirteen have been reported from the Indian sub continent which represent the oriental species. The first report from the Indian sub continent pertains to Ophryocotyloides meggitti Moghe. 1933 from the bird, corvus splendens. Other workers who have contributed to the knowledge of the cestode genus from Indian sub

continent are Moghe et Inamdar, 1934; Inamdar, 1944; Singh,1962; Gupta et Grewal, 1971; Malhotra et Capoor, 1979; Tewari, 1987 and Dixit and Kushwaha, 1994.

According to Schmidt, 1986 and Sub genus belong to Raillietina (Raillietina) Fuhrmann, 1920 contains one hundred and seventy four species. Out of which fifty four species have been reported from the Indian sub continent. The first report of the sub genus pertains to Raillietina (Railletina) frontina (Dujardin, 1845) Fuhrmann, 1924 in Gecinus Viridis, Dendropus major, Dendropus tennirostris, Dendropus medius, Picus martius, Picus carelini, Colaptes campestris, Oriolus galbula, Dryocopus martius, Lanius excubitor, Campethera nubica, Picus canase from Indochina, south America and Europe. The firstreport of the subgenus from the Indian sub continent is that of Raillietina (Raillietina) volzi (Fuhrmann, 1905) Fuhrmann, 1924 in Gallus gallus, columba livia, Pava cristatus from sumatra, India and Russia . The other workers who have contributed to the knowledge of this cestode subgenus are Sinha, 1960; Gupta et Grewal, 1969, 1971; Malviya et Dutt, 1971; Gupta et Madhu, 1981. The present new species represents the first report of the genus from the Bundelkhand region.

The genus Choanotaenia Railliet, 1896 conains as many as seventy eight species from the

whole world. Twenty one species from the Indian sub continent. The first report of the genus is Choanotaenia nilotica (Krabbe. 1869) Railliet, 1896 in Cursorius isabellinus from North Africa. In India the first report of the genus *Choanotaenia gondwana* Inamdar. 1984 in *Passer domesticus*. The other workers who have contributed to the knowledge of these cestodes are Saxena, 1972: Dixit and Capoor. 1989. The present new species represents the first report of the genus from Bundelkhand region.

The two new genera Jalpai n.g. and Raksia n.g. is a representative of the subfamily Dilepidinae Fuhrmann 1907. The family Dilepididae Railliet et Henry 1909, comprises fifty eight genera from the whole world. The present form Jalpai sipriensis n.g., n.sp. is the first report of the subfamily Dilepidinae Fuhrmann, 1907 from an avain host in whole of the world.

The genus Amoebotaenia Cohn. 1900 contains twenty two species from the whole world. The first report of the genus is that of Amoebotaenia cuneata (Linstow, 1872) Cohn , 1900. So far twelve species have been reported from the Indian sub continent. The first report of the genus from the Indian sub continent is that of Amoebotaenia setosa Burt, 1940 in Labipluvia melabarica from Sri Lanka. The other workers who have

contributed to the knowledge of this genus are Pillai et Peter, 1971: Shinde, 1972: Kalyankar et Palladwar, 1977 ; Srivastava, 1979: Shinde, Ghare et Suryawanshi, 1980: Dixit and Capoor, 1981: Srivastava and Srivastav, 1987 and Srivastava, Srivastav and Khare, 1995.

The three new genera Laterotestina n.g.: Vireshwari n.g. and Transvertia n.g. represents the subfaimly Dilepidinae Fuhrmann, 1907 of the faimly Dilepididae Railliet et Henry: 1909. The subfaimly Dilepidinae Fuhrmann, 1907 comprises fifty eight genera from the whole world.

The genus Armadoskrjabinia Spasskii et Spasskaja, 1954 contains eight spacies from the whole world which includes two from the Indian sub contient and the oriental region. The first report of the genus partain to that of Armadoskrjabinia rostellata (Abildgaard, 1790) Yamaguti, 1959 (syn. Taenia rostellata Abildgaard, 1790, T. capitellata Rudolphi, 1810, Diplacanthus (Dilepis) capitellata Cohn, 1899, Hymenolepis capitellata Railliet, 1899), in colymbus grisegena, colymbus spp., Podiceps hooboelli, Gavis spp., Europe, North America. The first report of the genus from the Indian subcontenent is that of Armadoskrjabinia medici (Stossich, 1890) Spasskii et Spasskaja, 1954 Syn. Taenia medici stossich, 1890, Hymenolepis medici (Stossich 1890) Fuhrmann 1906. We

inlandia medici (Stossich 1890) Mayhew 1925, Dicranotaenia medici (Stossich 1890), Skrjabin et Mathevossian, 1945. Echinorhynchotaenia medici (Stossich, 1890) Baer, 1959), in Pelecanus onocrotalus, P. Philippensis, P. refesiens: Europe, Africa, India, Malaya. The present new species is the third species of the genus Armadoskrjabinia from the Indian sub continent and the oriental region.

The genus passerilepis Spasskii et Spasskaja, 1954 contains twenty seven species from the whole world. The first report of the the genus partains to Passerilepis crenata (Goeze, 1782) Sultanov et Spasskaja, 1959 in Corvus from Russia. So far six species have been reported from the Indian sub continent. The first report of the genus from the Indian sub Continent is that of Passerilepis passeris (Gmelin, 1790) Spasskii et Spasskaja 1954 in Passer domestiocus from India. The other workers who have contributed to knowledge of this genus are Fuhrmann, 1918; Meggitt, 1933; Burt, 1944; Sawada et Kugi, 1980; Gigon et Burt, 1991; Rani, 1993. The present new species Passerilepis domestica n.sp. represents the second report of the genus from Bundelkhand region.

The new genus Hardayali n.g. is a representative of the family Hymenolepididae Railliet et Henry, 1909; Sub family Hymenolepidinae Perrier,

1897. The Sub family comprises seventy six genera from the whole word.

The genus Dicranotaenia Railliet, 1892 contains fifty five species from the whole word. The first report of the genus pertains to Dicranotaenia aequabilis (Rudolphi, 1810) Railliet, 1893 in cygnus sp. from Russia. So far six species have been reported from the Indian sub continent. The first report of the genus from Indian subcontinent is that of Dicranotaenia anandalei (Southwell, 1922) Lopez-Neyra 1932 in Limosa belgicae from India. The other workers have contributed to the knowledge of the genus are Burt, 1944; Srivastav and capoor, 1980; Sawada and Kugi, 1981 and Daisy Rani 1993.

The genus Variolpis Spasskii et Spasskaja, 1954 contains thirty three species from the whole world. Out of them six have been reported from the Indian sub continent. The first report of the genus pertains to Variolepis farciminosa (Goeze, 1782 ) in Sturnus vulgaris, Sturnus oriolus, Pica pica, Gracupica nigricollis, Acridotheres tristis, Corvus, Garrulus from Europe. The first report of the genus from Indian sub continent is that of Variolepis planestici ( Mayhew, 1925 ) Spasskii et Spasskaja, 1954 in Acridotheres tristis from India. Uther woekers have contributed to the knowledge of this genus are Inamder,

1934; Tewari, 1987 and Kuoi, 1990.

The present new genus Unischistotaenia represents the family Amabiliidae Ransom, 1909. So far only five genera have been reported from the whole world. Out of them four genera have been reported from the oriental region and indian sub-continent. The present new genus is the fifth from the Indian sub continent and the oriental region.

The new genus Podiposthe n.g. is a representative of the family Diplopostnidae Poche, 1926. The family Diplopostnidae Poche, 1926 comprises of three genera from the whole world. The present from Podiposthe hridvaii n.g., n.sp. is the first report of the family Diplopostnidae Poche, 1926 from the Indian sub continent.

The genus Jhansizia Kani, Tewari and Khare, 1995 comprises of single species, Jhansizia jhansiensis in Podiceps ruficollis which has been reported from the Indian sub continent and the oriental region. The present new species Jhansizia tikamgarhensis n. sp. represents the second species from the Bundelkhand region.

The new genera Bundelkhandia n.g; Dimorphocestus n.g. and Podicelia n.g. represent the family Dioecocestidae Southwell, 1930. The genera Bundelkhandia n.g. and Dimorphocestus n.g. represents

the sub family Dioecocestinae Fuhrmann, 1936. So far single genus Dioecocestus has been described under this sub family.

The present new form Podicelia n.g. does not fall in the existing sub family Dioecocestinae Fuhrmann, 1936 and Gyroceliinae Yamaguti, 1959 hence a new sub family Podiceliinae n.sub.fam. is created for the new genus.

# HISTORICAL

Several workers have contributed to the knowledge of cestode taxonomy from the Indian subcontinent. Southwell contribution has been classical. Apart from his classical volume of fauna of British India, his pioneering contributions include the descriptions of many new species. In 1913 Southwell reviewed the cestode material then existing in the Indian museum collection. The review included the description of twenty species and the redescription of some known species. The other important contributions of Southwell from avian hosts include *Tetrabothrius erostris (1916), Paradilepis kempi (1921), Dicranotaenia annadalei (1922), Raillietina (R.) fuhrmanni (1922), Raillietina (S.) centropi (1922), Spiniolans microsoma (1922), Parvirostrum magnisomum (1930)* and *Raillientina (F.) korkei (1930)* and *Raillietina (F.) maplestonei* (1930). It will not be an exaggeration to say that his contributions gave great stimulus and a direction to the study of cestodes in this subcontinent and its neighbourhood.

Meggitt's studies comprised forms mainly from Burma and included *Cotugnia fastigata (1920), Hottuynia jinstoni (1921), Cotugnia cuneata var. nersova (1924) Cotugnia tenius (1924), Raillietina (R.)*

*Parviuncinata (1924 with saw), Raillietina (R.) torquata (1924), Cotugnia seni (1924), Paricterotaenia barbara (1926), Paricterotaenia innominata (1926), Paricterotaenia maonicirrosa (1926), Raillietina (F.) birmanica (1926), Raillietina (F.) pseudoechinobothrida (1926), Raillietina (P.) facilis (1926), Raillietina (P.), reynoldsae (1926), Raillietina (R.) flaccida (1926), Staphylepis rustica (1926), Amoebotaenia frigida (1927), Anomotaenia dubia (1927), Anomotaenia fortunata (1927), Armadoskrjabinia maoniuncinata (1927), Choanotaenia aegyptica (1927), Cotugnia flegri (1927), Cotugnia polycantha var. pauci musculosa (1927), Diorchis longicirrosus (1927), Echinocotyle birmanica (1927) Hispaniolepis falsata (1927), Killigrewia frivola (1927), Killigrewia pamelae (1927), Liga facilis (1927), Nadejdolepis maonisaccis (1927), Paradilepis ficticia (1927), Paricterotaenia falsificata (1927), Raillietina (R.) famosa (1927), Raillietina (R.) flabralis (1927), Biuterina radiak (1928), Cotugnia fila (1931), Mesocestides tenuis (1931), Raillietina (F.) fecunda (1931) Raillietina (R.) flaminata (1931), Raillietina (R.) fragilis (1931), Raillietina (R.) pseudocrytus (1931), Dioecocestus fevita (1933), Mayhewia filta (1933), Passerilepis fola (1933) and Raillietina (P.) fulvia (1933).*

The important contributions of Moghe from avain hosts comprises *Panuma chandleri (1925), Raillietina (R.) naopurensis (1925), Raillietina (R.) quadritesticulata (1925), Southwellia galinarum (1925), Baeria orbiuterina (1933), Echinocotyle oweni (1933), Ophryocotyloides megaitti (1933), Uncinuia acapillicirrosa (1933), Ophryocotyloides monacanthis (1934 with Inamdar), Paruterina septotesticulata (1934 with Inamdar), Raillietina (R.) duosyntesticulata (1934 with Inamdar), Raillietina (R.) malpastina (1934 with Inamdar). He erected two new genera Southwellia (1925) and Baeria (1933).*

The investigations of Johri, L.N. ranged over Burma and several parts of India. His importants contributions comprise *Paruterina megaitti (1931), Raillietina (R.) perplexa (1933), Cotugnia januaria (1934), Cantugnia noctua (1934), Fuhonodaeum ganjeum (1934), Fuhonodaeum testifrontosa (1934), Vidhaia indica (1934), Oligorchis hieraticos (1934), Raillietina (S.) kakia (1934), Raillietina (R.) penetrans var. nova (1934), Haploparaxis Kamaruta (1935), Cotugnia longicirrosa (1938), Diorchis alvedea (1939), Diorchis chalcophapsi (1939), Diorchis lintoni (1939), Raillietina (P.) symonsi (1939), Microsomacanthus oroponka (1941), Oligorchis burmanensis (1941), Fuhonodaeum burmanense (1951),*

*Eugonodaeum bybralis (1951), Thaparea magnivesicula (1953), Hymenolepis jesuta (1960), Hymenolepis jerralta (1960), Hymenolepis longiovata (1962), and Killigrewia indica (1962). Johri established two new genera viz., Bidhaia (1934) and Thaparea (1953).*

Inamdar's contributions include *Malika pittae (1933), Choanotaenia gondwana (1934), Similuncinus totani ochropodis (1934), Shipleya ferrani (1942)* and *Ophryocotyloides bhaleroi* (1944).

Burt studied cestodes from Sri Lanka and his researches of forty years covered a very wide range and included descriptions of numerous forms including *Angularella magniuncinata (1938), Angularella minutiuncinata (1938), Notopentorchis colocalise (1938), Pseudangularia thompsoni (1938), Pseudangularia triplacantha (1938), Pseudochoanotaenia colicaliae (1938), Infula burhini (1939), Paronia diuterina (1939), Paronia calcauterina (1939), Paronia corylidis (1939), Amoebotaenia setosa (1940), Choanotaenia disper (1940), Choanotaenia magnihamata (1940), Cotugnia magna (1940), Cotugnia polyteldis (1940), Kowalewskiella glareolae (1940), Kowalewskiella stagnatilidis (1940), Malika kalawewaensis (1940), Malika zeylanica (1940), Microsomacanthus childi (1940), Onderstepoortia burhini (1940), Onderstepoortia lobipulviae (1940), Panuwa*

*Iobivanelli (1940), Paricterotaenia tringae (1940), Parvitaenia ardeolae (1940), Raillietina (R.) caprimulgi (1940), Dicranotaenia ellisoni (1944), Dicranotaenia uraganaensis (1944), Krimi chrysocolaptis (1944), Passerilepis septemsororum (1944).* Burt erected following new genera viz., *Pseudangularia (1938), Pseudochoanotaenia (1938), Notopentorchis (1938), Infula (1939), Panuwa (1940)* and *Krimi* (1944) from avian hosts. Some of Burt's species have been reported from India also.

Sharma (1943) contributed following new species from Nepal, *Dicranotaenia apicaris, Hispaniolepis Kaiseris, Hymenosphenacanthus ranoonica, Microsomacanthus jamunicus, Nepalesia jeodhii, Raillietina (R.), nepalis Raillietina (R.) parbata, Raillietina (R.) chilmei, Raillietina (R.) kantipura, Raillietina (R.) nripendra Raillietina (S.) dhuncheta, Staphylepis infrequens and vampirolepidoides krishna. Sharma* erected a new genus, Nepalesia.

Singh, K.S. has done extensive work on the morphology and taxonomy of cestodes from birds and mammals of India. His important contributions are *Angularella swifti (1952), Anoncotaenia gavai (1952), Aploparaksis tandani (1952), Aporina percnopteri (1952), Choanotaenia hypolaena (1952), Cotugnia gavali (1952), Dilepis ardeolae (1952), Diorchis tilori*

(1952), Echinocotyle hypoleuci (1952), Echinocotyle minutissima (1952), Haploparaxis tandani (1952), Hymenlepis ababili (1952), Hymenolepis crecca (1952), Hymenolepis gavgi (1952), Hymenolepis maona (1952), Hymenolepis makundi (1952), Lapwingia reticulosa (1952), Neoangularia ababili (1952), Neoliga diplacantha (1952), Notopentorchis micropus (1952), Parjcterotaenia mirvi (1952), Prooynotaenia longicirrata (1952), vitta swifti (1952), Indotaenia indica (1962), Ivritaenia myktesmarensis (1962), Uphryocotylodies makundi (1962), Urhryocotyloides picuri (1962), Aaillietina (A.) thapari (1963), Anoncotaenia indica (1964), Biuterina coracii (1964), Biuterina dicruri (1964), Choanotaenia tandani (1964), Uphtyocotyle indicus (1964), Panuwa stylicirrosa (1964), Oilepia kumaunensis (1962 with Tandon, B.K.) and Wayhenia levinei (1963 with Tandon, B.K.), Uphryocolytoides dasi (1964, with Tandon, B. K). Apart from the new species mentioned above Singh redescribed a number of old species as well. His new genera include Indotaenia, Ivritaenia, Lapwingia, Neoangularia and Neoliga.

Singh, K P described Echinorhychotaenia lucknowensis (1956), Choanotaenia aurantia (1958), Diorchis gigantocirrosa (1960), Anomotaenia oligorhyncha (1960), Biuterina megaitti (1960),

*Hymenolepis smythi* (1960), *Proovnotaenia leucura* (1960), *Bohrvocotvloides haemacephala* (1961).

The important contributions of Johri, G.N. are *Infula indica* (1958), *Dilepis balacea* (1960), *Hymenolepis ciconia* (1960) *Hymenolepis gracea* (1960), *Hymenolepis tanakpuria* (1960), *Cloacotaenia* (Syn.*Ladium* Johri, (1960) Spassky and Spasskaja, 1968, *Neoligorchis alternatus* (1960). He erected a new genus Neoligorchis.

Srivastava, V.C. has described *Killigrewia allahabadi* (Syn. *Columbia allahabadi*, 1965 with Capoor), *Ameobotaenia gallusiana* (1979), *Raillietina* (*R.*) *capoori* (1980), with Sawada), *Echinocotyle singhi* (1980, with Pande), *Rhabdometra agarwali* (1984 with pande), *Krimi simhai* (1984, with Tewari) and *nadejdolepis umashankari* (1987, with Srivastava) and *streptoperlia senegalensis* (1995 with Niqam)

Capoor, V.N. described *Taufikia ghoshi* (1966), *Mogheia bayamegaparuterina* (1967), *Hymenocoelia chauhani* n.g., n.sp. (1964, with Srivastava, V.C.), *Columbia muiri*(1966, with Srivastava V.C.), *Mogheia megaparuterina* (1966 with Srivastava, V.C.), *Davainea newetensis* (1972, with Dhawan), *Valipora sultanpurensis* (1975, with Srivastava, V.C. and Chauhan), and *Barbusa passeri* n.g., n.sp. (1975, with Srivastava V.C.) Capoor

and Srivastava, V.C. erected two new genera viz. *Barbusa and Hymenocoelia* new species *Marhenia ecopi; Griporhynchus pandii* (1990, 1992 with Mishra and Singh)

Shinde described a number of cestodes from Maharashtra. His important contributions are *Sureshia affinis* (1968), *Sureshia alii* (1968), *Lapwingia malabarica* (1972), *Lapwingia singhi* (1972), *Lapwingia rageshwarii* (1972), *Neyraia moghei* (1972), and *Neoliga singhi* (1981 with Jadhav and Kadam). He erected a new genus Madiangularia. New species Anonchotaenia single (1987), Krimi udgirensis (1987 with Gaikwad), Krimi tringae (1992 with Sonume and Gaikwad), Raillietina nagpurensis (1992 etal.) and Davainea Kromerii (1993 etal.)

Gupta, N.K. and Grewal, S.S. *described Raillietina (R.) buckleyi* (1968), *Raillietina (R.) streptopeliae* (1968), *Raillietina (R.) inda* (1970), *Cotugnia meggitti* (1971), *Ophryocotyloides corvorum* (1971), *Ophryocotyloides sharmai* (1971). Gupta and Madhu described Raillietina (R.) rybickae (1981) and Raiolietina (R.) delhiensis (1982).

Malviya and Dutt described a new species of Cotugnia (1969). *Raillietina (R.) mehrai* (1971), *Raillietina (R.) singhi* (1971), and *Raillietina (R) torquata* (1971).

Pandey, K.C. studied and described some species of cestodes from birds. He described two new species *Staphylepis indica and Staphylepis meoditti* (1981, with Javal, V.), *Nevraia meerutensis* (1982, with Chaudhary), *Lapningia sureshi* (1984), *Panuwa chauhani* (1984), *Panuwa roriensis* (1984) and *Sobolevicanthus meerutensis* (1983 with Kaivanshi).

Srivastava, A.K. described a number of cestode species from birds and mammals. They are *Vampirolepis molus* (1979, with Capoor), *Nevraia sultanpurensis* (1980), *Dicranotaenia alcippina* (1980, with Capoor), *Valipora amethiensis* (1981, with Capoor), *Ophryocotylus dinopli* (1982, with Capoor), *Cotugnia rihandensis* (1984, with Capoor), *Cotugnia parakeetus* (1985, with Capoor). He erected a new genus *Ophryocotyus* from the avain host.

The pioneer workers on the morphology and taxonomy of cestodes of birds from the Bundelkhand region are Srivastava, B.K. and Srivastava, A.K. They described *Amoebotania Capoori* (1987), *Nevraia davali* (1988), *Raillietina (R.) talpurensis* (1988), *Raillietina (R.) amethensis and Raillietina (R.) mathensis* (1988, with Dhirendra), *Doubleseting fotedari* (1989), *Killigrewia Srivastavai* (1989), *Decacanthus beundelnsis* (1989), *Amoebtaenia agrawali and*

*Anoncotaenia caudatai* (1993 with Khare). They erected new genus *Doubledesetina* (1989) from avain host. Daisy Rani, Tewari, J.P. and Pragya Khare erected new genus *Jhansiria* (1995), new species *Jhansiria jhansiensis* (1995) from avian host.

Gupta, S.P. and Sinha, N. described *Mogheia copsychi* (1982), *Mogheia orioli* (1982), *Angularella corvunensis* (1985), *Lateriporus dicruri* (1985) and *Neoangularia micropusi* (1985).

Apart from the aforesaid contributions a number of stray papers have been published by Fuhrmann, (1905, 1908, 1909 and 1912), Linstow (1906), Smith, Fox and White (1908), Johnston (1909, 1911), Baczynska (1914), Sondhi (1923), Joyeux (1928 with Houdemer, Subramanian (1928), Patwardhan (1935), Bhalerao (1936), Amin (1939, 1940), Mudaliar (1948), Chattarjee (1954), Mukherjee (1964, 1965, 1970), Ali and Shinde (1966), Fotedar 1973, 1976, 1977, 1980 with Chishti), Fotedar (1978 with Bambroo), Khan and Habibullah (1967, 1971) Dhawan and Capoor (1972), Chishti (1973, 1980), Fotedar (1974), Bilgees (1974, with Sultana), Ghosh (1975), Baugh and Saxena (1975, 1976).

Kalyankar and pailadwar (1977, Matta and Ahluwalia (1977), Wason and Johson (1977), Saxena (1978 with Baugh), Ghare and Shinde (1980), Grewal and Kaur

(1981), Jadhav and Shinde (1981 with 1998 Bharge), Kishore and Sinda (1982), Chisti (1982 with Khan), Srivastava, C.B (1983 with pandey, K.C. and Tayal, V), Kolluri, Vijaya Lakshmi and Rao (1984, 1985), Dixit and Capoor (1981) , Chisti (1986, Mir and Rasool), Bhalva and Capoor (1987a and 1987b), Sharma and Mathur (1987), Ashfaq (1989 with Shinde), Survawanshi (1990 with Jadhav), Gupta, V (1992, with Singh), Jadhav, B.V. (1993 with Nanaware), Dixit (1994 with Kushwaha).

## Material and Methods

The birds from Bundelkhand region were collected for the cestode parasites. Each bird was dissected with in twelve hours of the kill. In a large glass petridish full of normal saline water the intestine was opened with a slit. It was lightly shaken and the contents decanted several times. The intestine and its contents containing parasites were examined throughly under a binocular microscope to ensure that none of the parasite is left behind. Some of the cestodes that remained adherent to intestinal mucosa were detached by putting the intestine in hot (60 c) saline water. This induced the worms to relax and detach them selves from the intestine with out any injury to the scolax. The worms were stretched in luke warm water and in case of larger worms, by lifting them with the help of needles or forceps against the edges of petridishes repeatedly for several times and later on fixed in 5% formalin or alcoholic Bouin's fluid. Fixed and worms were stored in 5% formalin till needed for study.

The whole mounts were stained in either Borax carmine or Mayer's Haemalum. The Mayer's Haemalum proved to be the best stain for cestodes. Whole mounts were either cleared in xylol or clove oil.

Only camera lucida drawing were taken. All the measurements have been taken in millimeters unless otherwise stated. Averages have been mentioned in brackets. During the course of study the total number of host thus examined was 254. The hosts examined belong to 25 species of birds.

## HOST PARASITE LIST

| HOSTS | NUMBER EXAMINED | NUMBER INFECTED | CESTODES OBTAINED |
|---|---|---|---|
| Class Aves | | | |
| *Acridotheres tristis* | 4 | 1 | *Ophryocotylus prasadii n.sp.* |
| *Anas acuta* | 4 | 1 | *Dicranotaenia acuta n.sp.* |
| *Anas querquedula* | 7 | 2 | *Haruvali anasi n.g., n.sp.* |
| *Anthus novaeseelandiae* | 11 | 4 | *Ophryocotyloides choprai n.sp.* |
| *Aythya fuligula* | 4 | 1 | *Amoebotaenia vimleshi n.sp.* |
| *Butorides striatus* | 2 | nil | — |
| *Columa livia* | 13 | 2 | *Killigrenia kalpiensis n.sp.*<br>*Ophryocotylus oraiensis n.sp.*<br>*Raillietina (Raillietina) streptopeliae* |
| *Coturnix coturnix* | 15 | nil | — |
| *Francolinus podicerianus* | 21 | nil | — |
| *Fulica atra* | 4 | 1 | *Variolepis lali* |
| *Gallinula chloropus* | 7 | nil | — |
| *Gallus gallus* | 27 | 6 | *Choanotaenia sonoti* Mukhurjee, 1964<br>*Raillietina (Raillietina) jabalpurensis n. sp.*<br>*Cotugnia rihandensis* |

| | | | |
|---|---|---|---|
| *Hydrophasianus chirurgus* | 3 | nil | — |
| *Passer domestic* | 8 | 1 | *Passeridepis domestica n. sp.* |
| *Podiceps ruficollis* | 65 | 22 | *Amoebobaenia pharmacensis n. sp.*<br>*Armadoskrjabinia pandei n.sp.*<br>*Bunuelkhandia ruficollis n.g. n.sp.*<br>*Djomurabucestus hamirpurensis n.g. n.sp.*<br>*Jaipai sipriensis n.g., n.sp.*<br>*Jhansiella tikamgarhensis n. sp*<br>*Laterotestina nemarensis n.g., n.sp*<br>*Podicella sagarensis n.g., n.sp.*<br>*Podiposthe hridyali n.g., n.sp.*<br>*Unischistobaenia pannaensis n.g. n.sp*<br>*Variolepis podicepsi n. sp.*<br>*Vireshwari baruasagarensis n.g., n.sp.* |
| *Pterocles indicus* | 9 | nil | — |
| *Pycnonotus cafer* | 6 | 2 | *Haksia pycnonotus n.g., n.sp.* |
| *Streptopelia senegalensis* | 2 | nil | — |
| *Sturnus pagodarum* | 12 | 2 | *Raillietina (Raillietina) indica* |
| *Trianga glareola* | 11 | nil | — |
| *Turdoides malcolmi* | 3 | 2 | *Transvertia karevraensis n.g., n.sp.* |
| *Vanellus indicus* | 6 | nil | — |

## Classified list of the Cestode parasites Described in the thesis

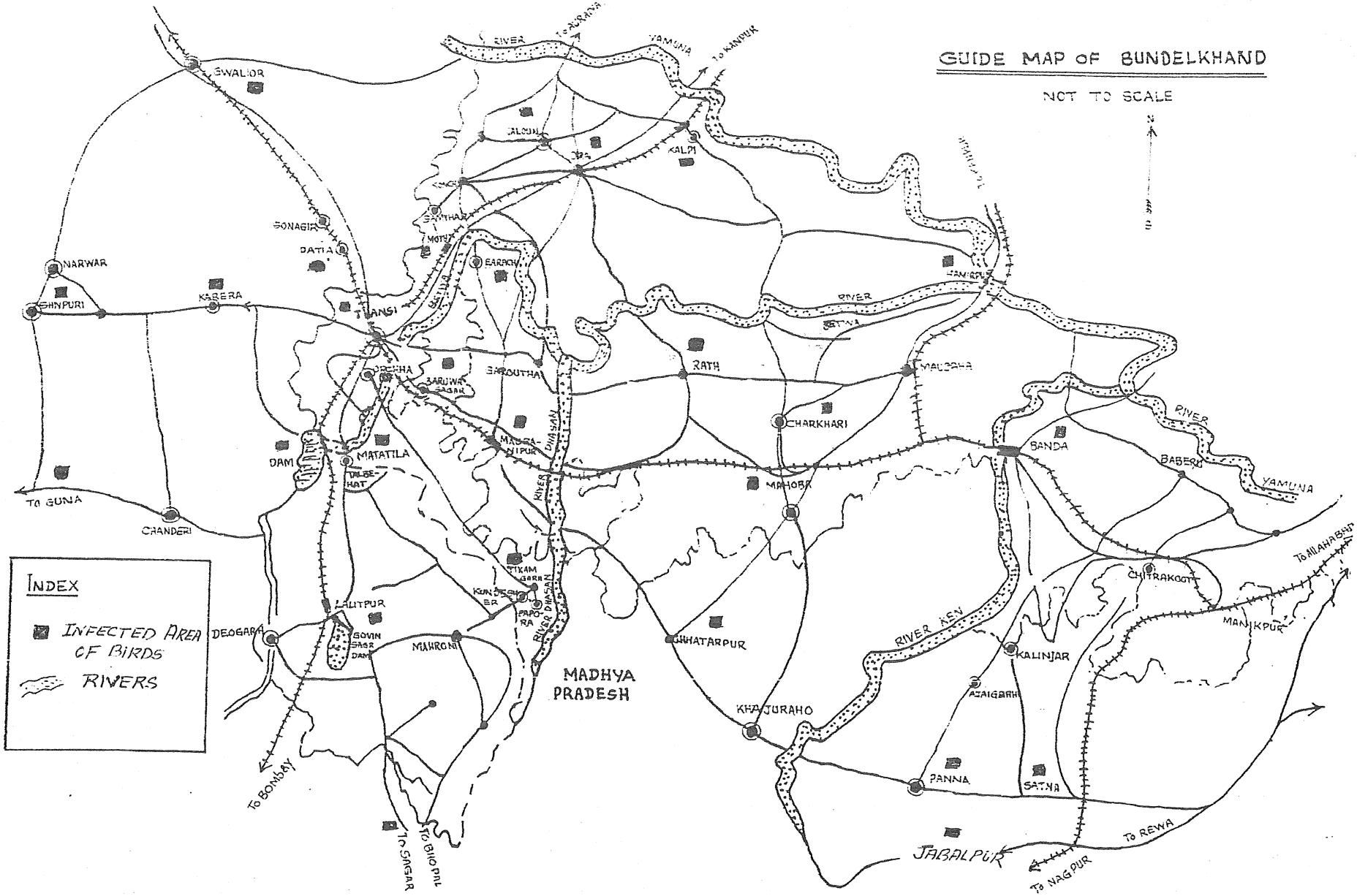
| | |
|---|---|
| Class | Cestoda |
| Subclass | Eucestoda Southwell, 1930 |
| Order | Cyclophyllidea Ben. in Braun, 1900 |
| Family | Anoplocephalidae Cholodkovsky, 1902 |
| Subfamily | Anoplocephalinae Blanchard 1891 |
| Genus | Killigrewia Meggitt,1927 |
| Species | Killigrewia kalpiensisn.sp. |
| Family | Davaineidae Fuhrmann, 1907 |
| Sub family | Ophryocotylinae Fubrmann, 1907 |
| Genus | OphryocotylusSrivastav etCapoor, 1982 |
| Species | Ophryocotylus oraiensisn.sp. |
| Species | Ophryocotylus prasadiin.sp. |
| Genus | OphryocotyloidesFuhrmann, 1920 |
| Species | Ophryocotyloides chooraln.sp. |
| Genus | RaillietinaFuhrmann, 1920 |
| Subgenus | RaillietinaFuhrmann, 1920 |
| Species | Raillietina (Raillietina) jabalpurensis n. sp. |
| Family | Dilepididae Railliet etHenry, 1909 |
| Subfamily | Dipylidiinae Stiles, 1896 |
| Genus | ChoanotaeniaRailliet, 1896 |
| Species | Choanotaenia sonotiMukhurjee, 1964 |
| Subfamily | Dilepidinae Fuhrmann, 1907 |
| Genus | Jalpain.g. |
| Species | Jalpai sipriensisn.g., n.sp. |

| | |
|---|---|
| Genus | Raksian.g. |
| Species | Raksia cycnonotusn.g., n.sp. |
| Genus | AmoebotaeniaCohn, 1900 |
| Species | Amoebotaenia gharmauensisn.sp. |
| Species | Amoebotaenia vimleshiin.sp. |
| Genus | Laterotestinan.g. |
| Species | Laterotestina newarensisn.g., n.sp. |
| Genus | Vireshwarin.g |
| Species | Vireshwari baruasagarensisn.g., n.sp. |
| Genus | Transvertian.g. |
| Species | Transvertia karayrensisn.g., n.sp. |
| Family | Hymenolepididae Railliet et Henry, 1909 |
| Subfamily | Hymenolepidinae Perrier, 1897 |
| Genus | ArmadoskrjabiniaSpasskii et Spasskaja, 1954 |
| Species | Armadoskrjabinia candsin.sp. |
| Genus | PaseriliepisSpasskii et Spasskaja, 1954 |
| Species | Paseriliepis domesticsn.sp. |
| Genus | Haradayalin.g. |
| Species | Haradayali amasin.g., n.sp. |
| Genus | DicranotaeniaRailliet, 1892 |
| Species | Dicranotaenia acutsn.sp. |
| Genus | VariolepisSpasskii et Spasskaja, 1954 |
| Species | Variolepis lalin.sp. |
| Species | Variolepis podicepsin.sp. |
| Family | Amabilliidae Ransom, 1909 |
| Genus | Unischistotaenian.g. |

| | |
|---|---|
| Species | Unischistotaenia pannaensien.g., n.sp |
| Family | Diplopoasthidae Pocha, 1926 |
| Genus | Podipoasthen.g. |
| Species | Podipoasthe hridyaiin.g., n.sp. |
| Family | Dipococestidae Southwell, 1930 |
| Subfamily | Dipococestinae Fuhrmann, 1936 |
| Genus | JhansiziaRani, Tewari, and Khare, 1975 |
| Species | Jhansizia tikamgarhensien.sp. |
| Genus | Bundelkhandia n.g. |
| Species | Bundelkhandia ruficollien.g., n.sp. |
| Genus | Diomorphocestusen.g. |
| Species | Diomorphocestus hamirpurensis n.g., n.sp. |
| New Subfamily | Podicoliinae n. subfamily |
| Genus | Podicolian.g. |
| Species | Podicolia sagarensisn.g., n.sp. |

# PART - II

# MORPHOLOGY AND TAXONOMY OF CESTODE PARASITES




Map Indicating Zoogeographical Distribution of Infected Birds.

Family : Anoplocephalidae Cholodkovsky, 1902

Subfamily : Anoplocephalinae Blanchard, 1891

Genus : Killigrewia Meggitt, 1927

Species : Killigrewia kalpiensis n.sp.

( Figs:1-4 ,pp 42 )

Out of eight pigeons, Columba livia (Gmelin) examined at Kalpi, one was found infected with single specimen in its intestine. The morphological studies of the cestode revealed them to belong to the genus Killigrewia Meggitt, 1927 of the subfamily Anoplocephalinae Blanchard, 1891; family Anoplocephalidae Cholodkovsky, 1902.

Cestode measure 135 cm in length and 3.480 in maximum width. Strobila consists of acraspedote and craspedote proglottids, all broader than long.

Scolex measures 0.336 x 0.264, not well demarcated from the neck. Suckers four, unarmed, oval to round measure 0.072 - 0.096 x 0.060 - 0.072 ( 0.084 x 0.066). Rostellum absent.

Neck prominent measures 0.833 x 0.357 . Immature proglottids measure 0.511 - 0.985 x 0.408 - 10173 ( 0.748x0.790); mature proglottids measure 0.456-0.540x2.280-3.480(0.498x2.881) and gravid proglottids measure 0.780-1.068x3.120-3.360 (0.924x3.240).

Testes oval to round, 55-106(81) in number divided into two groups by the female genitalia. Poral group

shows 12-39 testes while the aporal group with 43-67 testes. Testes measures 0.024-0.048x 0.024-0.048(0.036x0.036). Cirrus pouch, 0.120-0.288x0.036-0.072 (0.204x0.054), never crosses the aporal ventral longitudinal excretory canal. Internal seminal vesicle measures 0.061-0.132x0.012-0.036 (0.096x0.024). External seminal vesicle absent.

Female genitalia in anterior half of the proglottid. Ovary transverse with many out growths measures 0.120-0.216x0.360-0.708 (0.168x0.534). Vitelline gland large irregular shape measures 0.084-0.156x0.168-0.240 (0.120x0.204). Vagina measures 0.012 - 0.031 (0.022) in diameter. Receptaculum seminis measures 0.062-0.108x0.036-0.061 (0.085x0.049).

Genital atrium, 0.018-0.084 (0.051) deep and 0.012-0.061 (0.036) wide. Genital openings alternate irregularly, situated in middle half of the proglottid margin.

Uterus sac like with many out growths towards anterior and posterior sides, uterus measures 0.048-0.876x2.160-3.012 (0.462x2.586). Eggs measure 0.0096-0.0128x0.0096-0.0128 (0.0112x0.0112). Onchospheres measure 0.0048-0.008x0.0048-0.0080 (0.0064x0.0064).

Ventral longitudinal excretory canal measures 0.012-0.121 (0.067) in diameter.

## Discussion

The present form comes closer to Killigrewia allahabadi Srivastava and Capoor, 1965; Killigrewia delafondi Railliet, 1892; Killigrewia frivola Meggitt, 1927; Killigrewia Srivastavai Srivastava and Srivastav, 1989 and Killigrewia streptocoeliae Yamaguti, 1935.

The present form differs from K allahabadi Srivastava and Capoor, 1965 in having larger scolex, smaller suckers, fewer number of larger testes, larger cirrus pouch, larger internal seminal vesicle, absence of external seminal vesicle, narrower ovary, narrower irregular shaped vitelline gland, smaller receptaculum seminis and smaller eggs. From K. delafondi Railliet, 1892 it differs in having larger scolex, fewer number of testes, larger cirrus pouch which never reaches upto ventral longitudinal excretory canals, smaller internal seminal vesicle, absence of external seminal vesicle, narrower ovary, different shape of Vitelline gland, smaller receptaculum seminis, uterus with many out growths and smaller eggs. From K. frivola Meggitt, 1927 it differs in having presence of scolex, fewer number of testes, larger cirrus pouch which never reaches upto Ventral longitudinal excretory canal, absence of external seminal vesicle and smaller eggs. From K. Srivastavai Srivastava and Srivastav, 1989 in having

larger scolex, smaller suckers, fewer number of smaller testes, larger cirrus pouch which never crosses the ventral longitudinal excretory canal, different shape of wider ovary, different shape of vitelline gland, presence of internal seminal vesicle, narrower receptaculum seminis and smaller eggs. From K. Stneotopellae Yamaguti, 1935 it differs in having larger scolex, presence of neck, fewer number of testes, larger cirrus pouch which never reaches upto Ventral longitudinal excretory canal, smaller internal seminal vesicle, absence of external seminal vesicle,wider ovary, narrower vitelline gland, smaller receptaculum seminis and smaller eggs.

In the light of above discussion it is proposed to accommodate as a new species, Killigrewia kalpiensis n. sp.

Host : Columba livia (Gmelin)

Habitat : Intestine

Locality : Kalpi,
Jalaun (U.P.)

Holotype : Department of Zoology,
Bipin Bihari (P.G.) College, Jhansi.

Killigrewia kalpiensis n.sp.

Fig 1 Scolex (5x10)

Fig 2 Mature proglottid (5x10)

Fig 3 Gravid prolottid (5x10)

Fig 4 Egg (10x45)

Abbreviations :- CP, cirrus pouch; E, egg; GA, genital atrium; ISV, internal seminal vesicle; O, ovary; ON, onchospheres; RS, receptaculum seminis; S, sucker; SC, scolex; T, testes; U, uterus; V, vagina; VG, vitelline gland; VLEC, ventral longitudinal excretary canal.

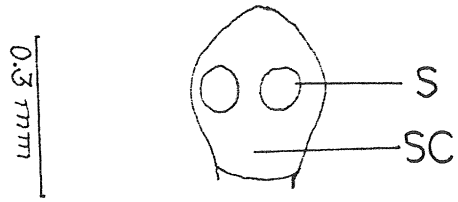



Fig 1

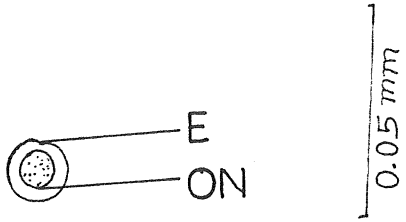



Fig 4

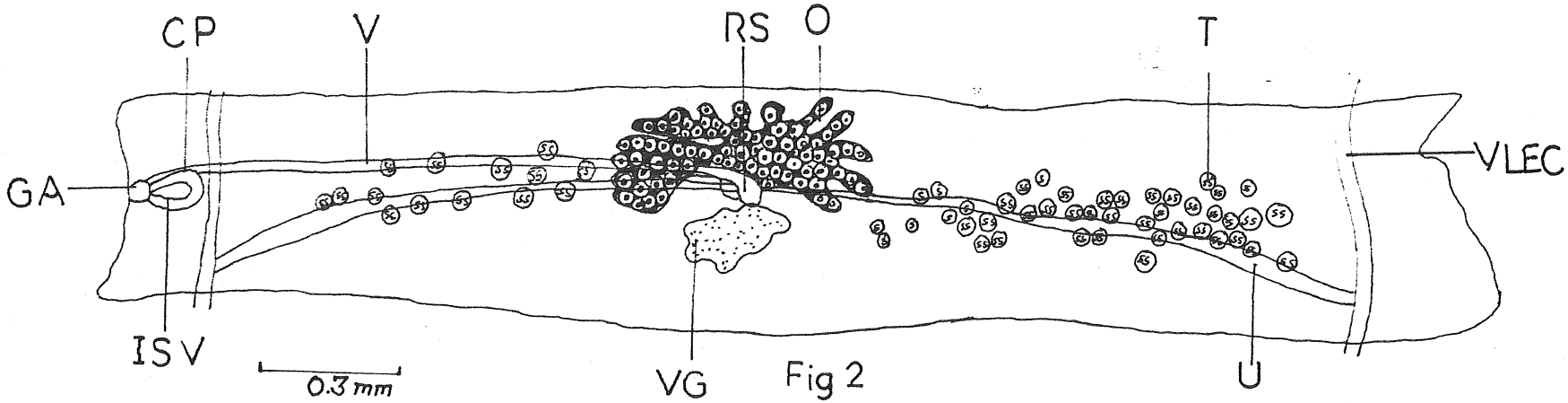



Fig 2

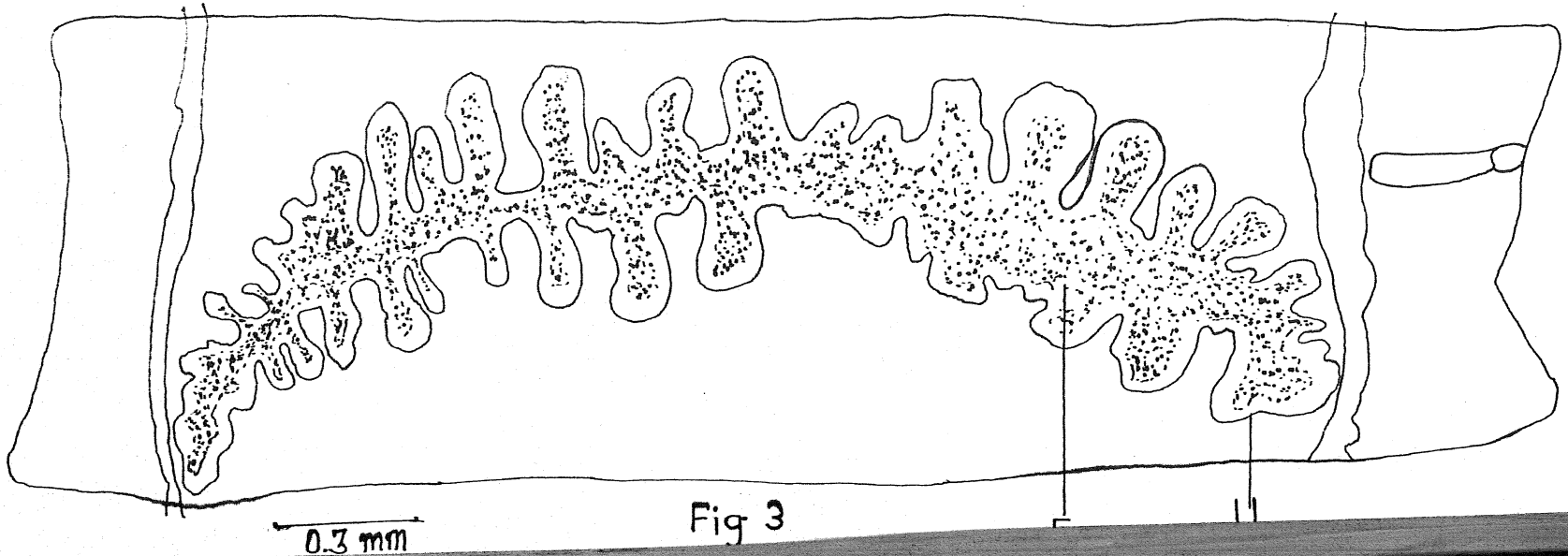



Fig 3

Family – Davaineidae Fuhrmann, 1907

Subfamily – Ophryocotylinae Fuhrmann, 1907

Genus – Ophryocotylus Srivastav et Capoor, 1982

Species – Ophryocotylus oraiensis n. sp.

(Figs. 1-5, PP 48 )

Out of five pigeons, *Columba livia* (Gmelin) examined at Orai, Distt. Jalaun (U.P.). One was found infected with seven alike cestodes. Cestodes was present in the intestine of the host. Morphological studies of the cestodes revealed them to belong to the genus *Ophryocotylus* Srivastav *et* Capoor, 1982 of the Subfamily Ophryocotylinae Fuhrmann, 1907; family Davaineidae Fuhrmamm, 1907.

Cestodes measure 80-110 in length and 0.648 in maximum width as seen in the gravid proglottids. Strobila consists of a number of proglottids. Proglottids broader than long and Craspedote.

Scolex, 0.108-0.252x0.150-0.348(0.180x0.249). Suckers four, oval to round, 0.072-0.090x0.054-0.084 (0.081x0.069). Suckers armed with 3-4 rows of spines. Sucker spines,0.0016-0.0024(0.0020).Rostellum disc shaped,0.066-0.095x0.078-0.144(0.078x0.111).Rostellar hooks,0.0096-0.0128(0.012) in length. Rostellum bears 190-250 (220) rostellar hooks arranged in single row.

Neck, 0.372-0.480x0.144-0.210 (0.426x0.177).

Immature proglottids, 0.012–0.132x0.108–0.312 (0.072x0.210); mature proglottids, 0.126–0.210x0.318–0.468 (0.168x0.393) and gravid proglottids, 0.192–0.301x0.312–0.648 (0.246–0.480).

Testes 10–18 (15) in number, oval to round and distributed posterolateral to femalagenitalia. Testes, 0.012–0.031x0.012–0.030 (0.021x0.021). Cirrus pouch club shaped, 0.048–0.090x0.012–0.042 (0.071x0.027), crosses the Ventral longitudinal excretory canal. Vas deferens present. Internal and external seminal vesicles absent.

Famala genitalia situated in the middle of the proglottid. Ovary bilobed, 0.021–0.048x0.024–0.060 (0.035x0.042). Vitelline gland compact, postovarian, 0.006–0.018x0.024–0.042 (0.012x0.033). Vagina, 0.006–0.015 (0.011) in diameter, opens posterior to cirrus pouch in the genital atrium. Receptaculum seminis, 0.024–0.042x0.006–0.012 (0.033x0.009).

Genital atrium, 0.018–0.042 (0.033) wide and 0.024–0.042 (0.033) deep. Genital pores unilateral located in the middle of the proglottids margin.

Uterus sac like, persistant, 0.144–0.240x0.168–0.270 (0.192x0.219), between the limits of Ventral longitudinal excretory canals. Eggs, 0.008–0.020x0.008–0.0193 (0.014x0.0136). Onchospheres, 0.0064–

0.0096x0.0064-0.0096 (0.008x0.008).

Ventral longitudinal excretory canals. 0.006-0.024 (0.015) in diameter.

## DISCUSSION

The present form comes closer to Ophryocotylus dinoiiSrivastav etCapoor, 1982. However, it differs from Ophryocotylus dinoiiSrivastav etCapoor, 1982 in having larger worms, smaller scolex, smaller suckers, larger rostellr hooks, fewer number of smaller testes, smaller cirrusa pouch which crossas the porsal ventral longitudinal excretory canal, narrower ovary, smaller vitelline gland, smaller receptaculum seminis, smaller uterus, smaller eggs and locations of genital pores.

In the light of above discussion the present form is accommodated as a new species, Ophryocotylus oraiensisn.sp.

Host : Columba livia(Gmelin)

Habitat : Intestine

Locality : Orai, Jalaun (U.P.)

Holotype : Department of Zoology
Bipin Bihari (P.G.) Collage,
Jhansi.

Ophryocotylus oraiensis n. sp.

Fig 1 Scolex with neck (10x10)

Fig 2 Rostellar hooks (10x45)

Fig 3 Mature proglottid (10x10)

Fig 4 Gravid proglottid (10x10)

Fig 5 Egg (10x45)

Abbreviations :- CP, cirrus pouch; E, egg; GA, genital atrium; N, neck; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook; S, sucker; SC, scolex; SS, sucker spine; T, testes; U, uterus; V, vagina; VG, vitelline gland; VLEC, ventral longitudinal excretory canal.

Ochryocotylus oraiensis n. sp.

Fig 1 Scolex with neck (10x10)

Fig 2 Rostellar hooks (10x45)

Fig 3 Mature proglottid (10x10)

Fig 4 Gravid proglottid (10x10)

Fig 5 Egg (10x45)

Abbreviations :- CP. cirrus pouch; E. egg; GA. genital atrium; N. neck; O. ovary; ON. onchospheres; R. rostellum; RH. rostellar hook; S. sucker; SC. scolex; SS. sucker spine; T. testes; U. uterus; V. vagina; VG. vitelline gland; VLEC. ventral longitudinal excretory canal.

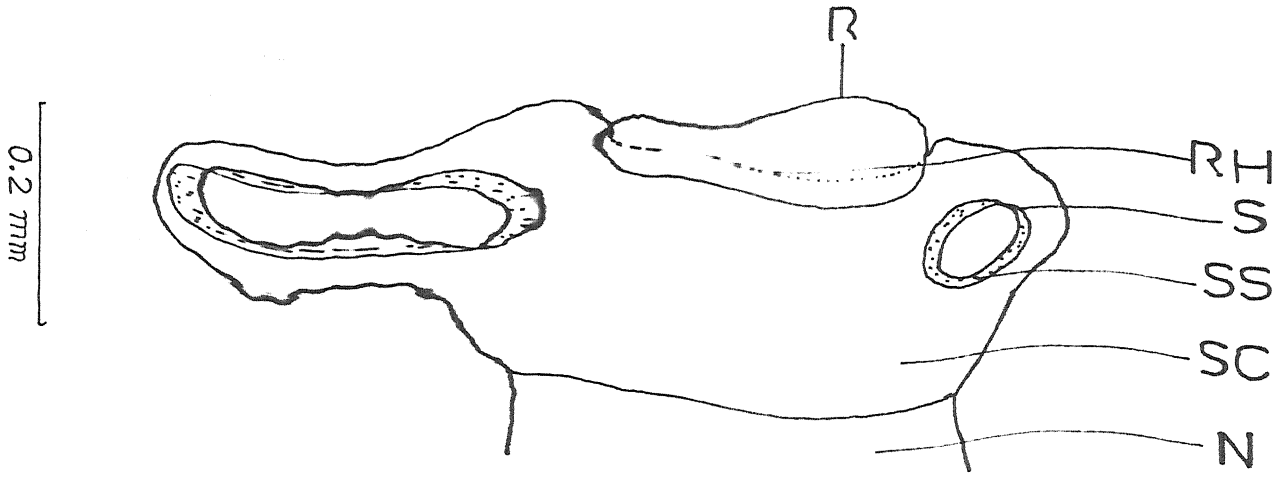



Fig 1

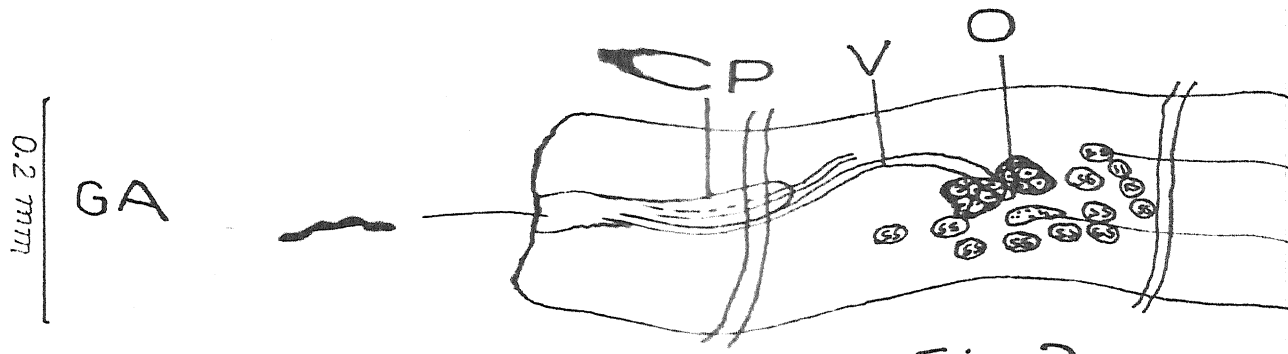



Fig 3

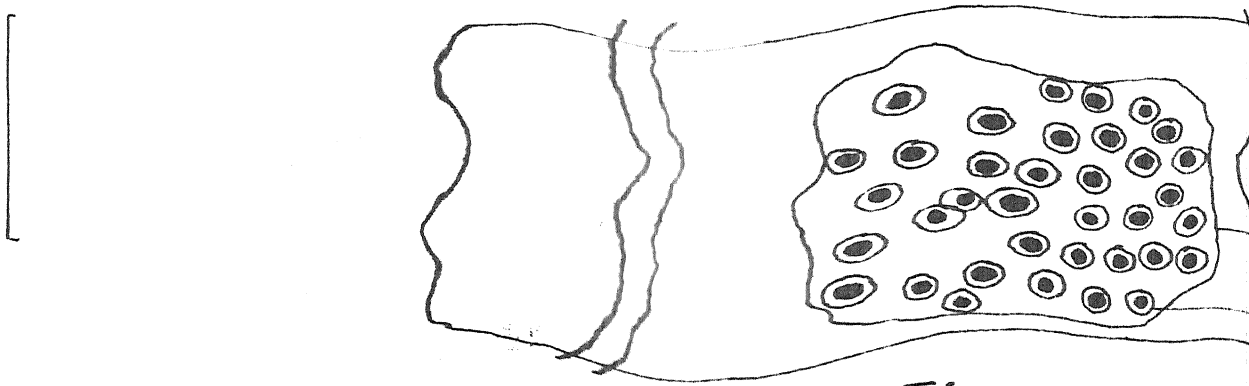



Fig 4

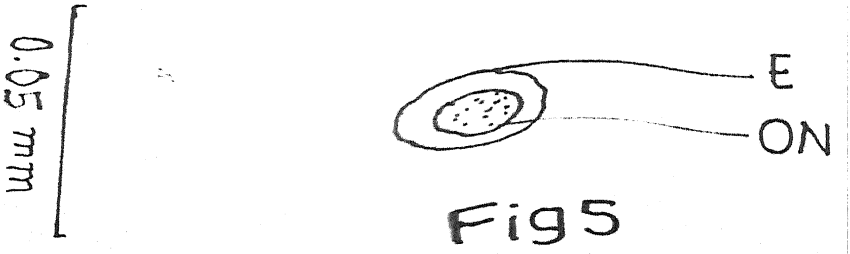



Fig 5

Ophryocotyle oraiens

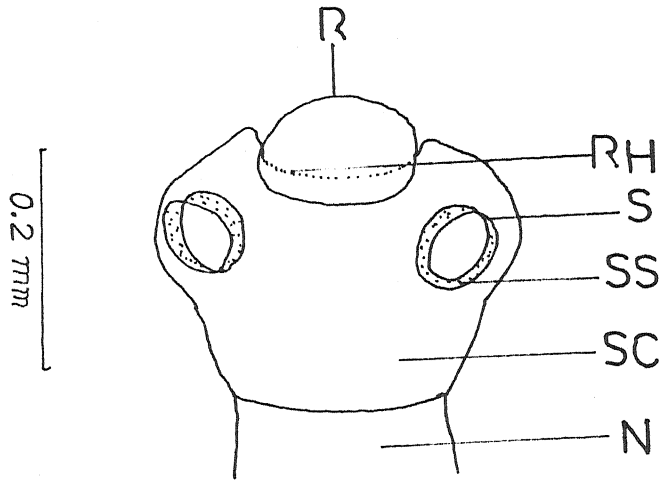



Fig 1

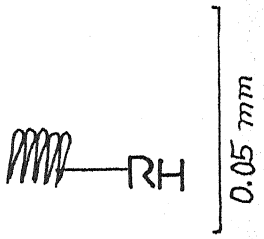



Fig 2

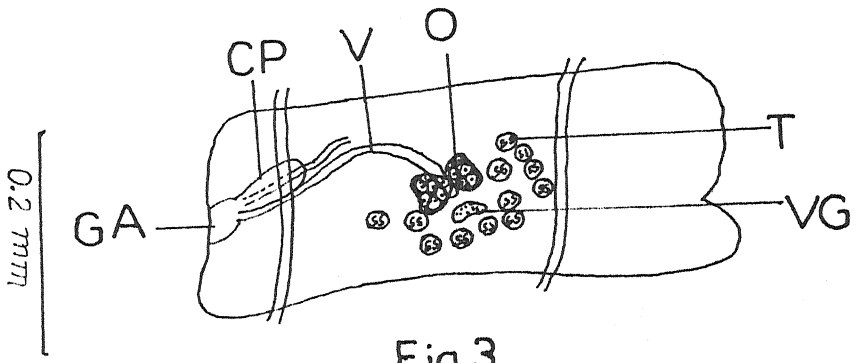



Fig 3

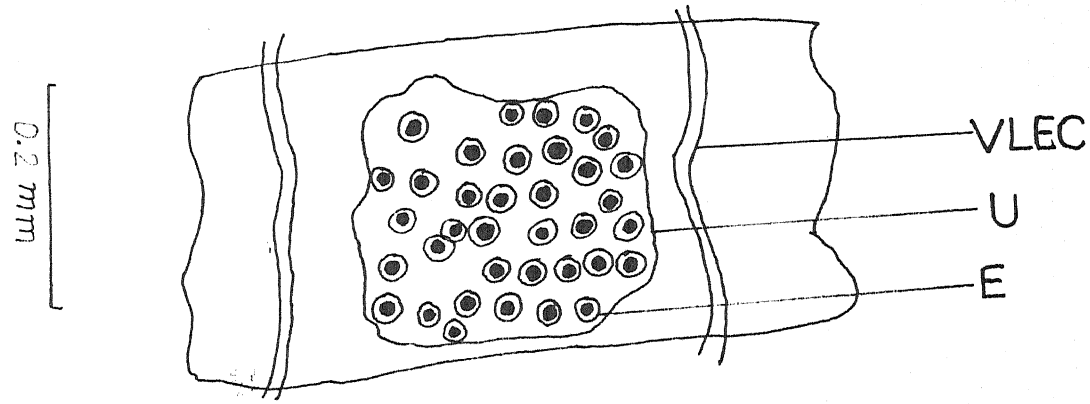



Fig 4

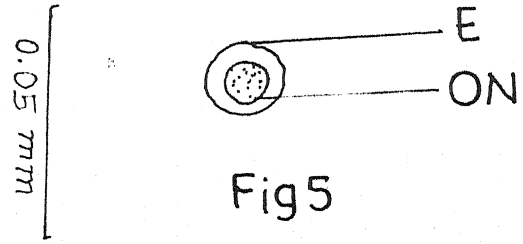



Fig 5

*Ophryocotylus oraiensis n.sp.*

Family - Davaineidae Fuhrmann, 1907

Subfamily - Ophryocotylinae Fuhrmann, 1907

Genus - Ophryocotylus Srivastav et Capoor, 1982

Species - Ophryocotylus prasadii n. sp. (Figs. 1-5, PP 56 )

One out of four desimyna, Acridotheres tristis(L) examined at Rakaa Distt. Jhansi (U.P.) harboured single cestode in its small intestine. Morphological studies of the cestode revealed them belong to the genus Ophryocotylus Srivastav et Capoor, 1982; subfamily Ophryocotylinae Fuhrmann, 1907; family Davaineidae Fuhrmann, 1907.

Cestode measures 103 cm. in length and 0.852 in maximum breadth seen in mature proglottids. Proglottids usually broader than long and craspedote.

Scolex well demarcated from the neck. Scolex measures 0.216x0.181. Suckers oval to round, armed measure 0.108-0.114x0.036-0.048 (0.111x0.042).Sucker spines arranged in 3-5 rows, 0.001-0.003(0.002) in lenght. Rostellum disc shaped measures 0.048x0.055. Rostellum bears 170-180 rostellar hooks, arranged in a single row. Rostellar hooks measure 0.011-0.0144 (0.0132) in length.

Neck measures 0.870x0.144. Immature proglottids measure 0.024-0.108x0.210-0.660 (0.066x0.435); mature

proglottids measure 0.228–0.270x0.720–0.852 (0.249x0.786) and gravid proglottids measure 0.210–0.264x0.594–0.810 (0.237x0.702).

Testes 19–40, oval to round, completely surrounds the female genitalia and do not reach upto the Ventral longitudinal excretory canals. Testes measures 0.012–0.024x0.012–0.024 (0.018x0.018). Cirrus pouch club shaped measures 0.102–0.144x0.054–0.072 (0.102x0.063), crosses the ventral longitudinal excretory canal. Internal and external seminal vesicles absent.

Female genitalia median. Ovary irregular shape measure 0.066–0.091x0.102–0.138 (0.078x0.120). Vitalline gland postovarian measures 0.012–0.024x0.030–0.048 (0.018x0.039). Vagina measures 0.006–0.012 (0.009) in diameter, opens posterior to cirrus pouch in the genital atrium. Receptaculum seminis measures 0.048–0.078x0.0121–0.031 (0.066x0.021).

Genital atrium measures 0.042–0.078x0.018–0.061 (0.061x0.039) deep and wide respectively. Genital pores unilateral, located in the posterior half of the proglottid margin.

Uterus sac like, presistant, 0.114–0.189x0.354–0.468 (0.147x0.411). Uterus never reaches the ventral longitudinal excretory canals. Eggs measures 0.015–

0.024x0.015–0.024 (0.021–0.021). Onchospheres measure 0.009–0.021x0.009–0.022 (0.015x0.016).

Ventral longitudinal excretory canals measures 0.006–0.015 (0.011) in a diameter.

## Discussion

The present form comes closer to Ophryocotylus dinopii Srivastav etCapoor, 1982 and Ophryocotylus oraiensis n. sp. The present form differs from Ophryocotylus dinopiiSrivastav etCapoor, 1982 in having longer worm, narrower scolex, narrower suckers, smaller number of larger rostellar hooks, greater number of smaller testes surrounds the female genitalia which never reaches upto the Ventral longitudinal excretory canals, different shape of ovary, smaller slightly poral, vitelline gland smaller uterus which never reaches upto the ventral longitudinal excretory canals, smaller eggs and location of genital pores. From Ophryocotylus oraiensisn. sp. the present form differs in having narrower suckers, smaller rostellum, smaller number of larger rostellar hooks, greater number of testes completely surrounds the female genitalia, larger cirrus pouch, irregular shaped wider ovary, larger, vitelline gland larger receptaculum seminis, wider uterus and location of genital pores.

In the light of above discussion the present form

is accommodated as a new species, Ophryocotylus prasadiin. sp.

The new species is named in the honour of a social worker, late Shri D. P. Khare of Raksa, Jhansi, India.

Host : Acridotheres tristis(L)

Habitat : Small intestine

Locality : Raksa, Jhansi.

Holotype : Department of Zoology, Bipin Bihari (P.G.) College, Jhansi.

Table 3

Comparison of the characters of the species closer to Ophryocotylus prasadii n. sp.

| | O.dimopii Srivastav et Capoor, 1982 | O. oraiensis n. sp. | O. prasadii n. sp. |
|---|---|---|---|
| Size | 20.0-45.0x1.04 | 80-110x0.648 | 103x0.852 |
| Scolex | 0.209-0.57x0.266-0.532 | 0.108-0.252x0.150-0.330 | 0.216x0.181 |
| Suckers | 0.095-0.171x0.079-0.152 | 0.072-0.090x0.054-0.084 | 0.108-0.114x0.036-0.048 |
| Rostellum | 0.011-0.121x0.57-0.168 | 0.066-0.095x0.078-0.144 | 0.048x0.055 |
| Rostellar Hook No. | 120-280 | 084<br>190-250 | 170-180 |
| Size | 0.002-0.009 | 0.009-0.012 | 0.011-0.0144 |
| Testes No | 12-30 | 10-18 | 19-40 |
| Size | 0.011-0.075x0.011-0.075 arranged in posterolateral to female genitalia and reached upto VLEC | 0.012-0.030x0.012-0.030 arranged in posterolateral to female genitalia & testes of aporal side reaches upto VLCE | 0.012-0.024x0.012-0.02 Completely surrounds the female genitalia and do not reach upto VLCE |
| Cirrus | 0.076-0.19x0.022-0.076 | 0.048-0.090x0.012- | 0.102-0.144x0.054-0.072 |
| pouch | never crosses the VLEC | 0.042 crosses the VLEC | crosses the VLEC |
| Ovary | 0.019-0.087x0.045-0.178 lobulated | 0.054-0.084x0.024-0.060 bilobed | 0.066-0.091x0.102-0.138 irregular shape |

| | O.dincpii Srivastav et Capoor, 1982 | O. oraiensis n. sp. | O. prasadii n. sp. |
|---|---|---|---|
| Vitelline gland | 0.017-0.102x0.019-0.121 | 0.006-0.018x0.024-0.042 | 0.012-0.024x0.030-0.048 slightly poral |
| Receptaculum seminis | 0.026-0.076x0.015-0.045 | 0.024-0.042x0.006-0.012 | 0.048-0.078x0.0121-0.031 |
| Uterus | 0.19-0.95x0.361-0.76 reaches upto VLEC | 0.144-0.240x0.168-0.270 never reaches upto VLEC | 0.114-0.189x0.354-0.468 never reaches upto the VLEC |
| Egg. | 0.015-0.046x0.015-0.046 | 0.008-0.020x0.0080-0.0193 | 0.015-0.024x0.015-0.024 |
| Genital pore | Located in anterior 1/3rd of the proglottid margin. | Located in the middle of the proglottid margin. | Located in the posterior half of proglottid margin. |

Ophryocotylus prasadii n. sp.

| | | |
|---|---|---|
| Fig 1 | Scolex with neck | (10x10) |
| Fig 2 | Rostellar hooks | (10x45) |
| Fig 3 | Mature proglottid | (10x10) |
| Fig 4 | Gravid proglottid | (10x10) |
| Fig 5 | Egg | (10x45) |

Abbreviations :- CP, cirrus pouch; E, egg; GA, gential atrium; N, neck; O, ovary; ON, onchosoheres; R, rostellum; RH, rostellar hook; RS, receptaculum seminis; S, sucker;SC, scolex; SS, sucker spine; T, testes; U, uterus; V, vagina; VG, vitelline gland; VLEC, ventral longitudinal excretory canal.

0.2 mm

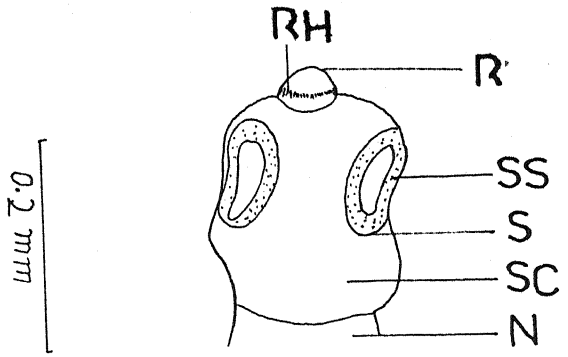



Fig 1

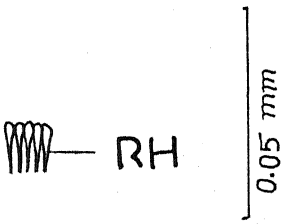



Fig 2

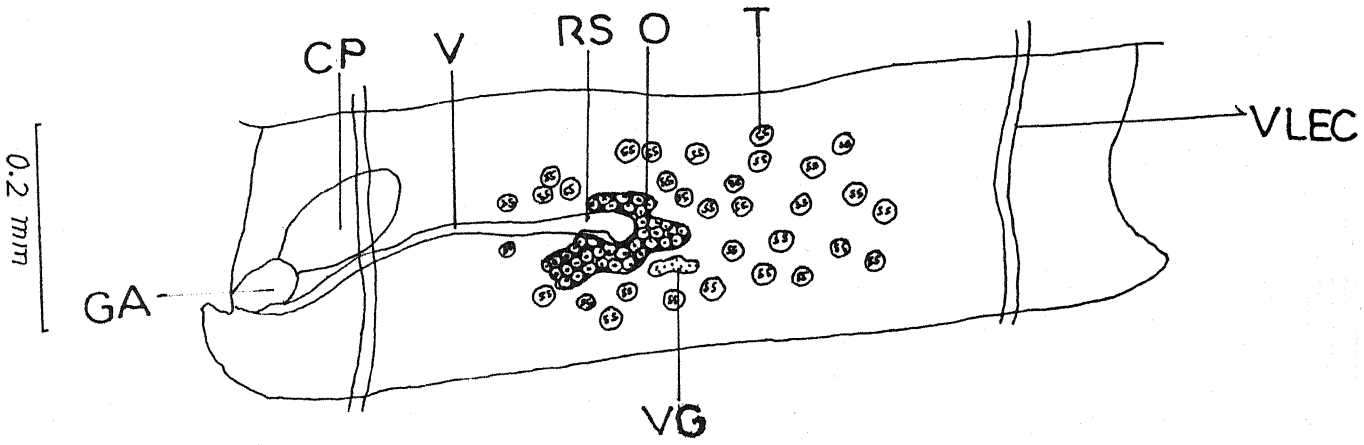



Fig 3

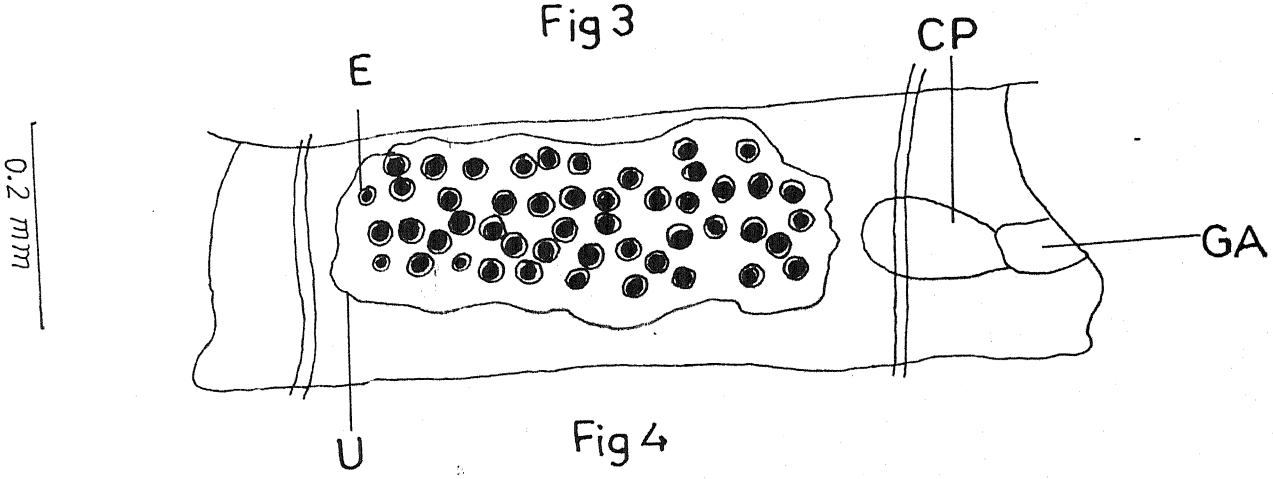



Fig 4

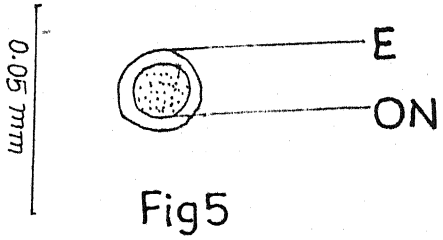



Fig5

*Ophryocotylus prasadi* n.sp.

Family – Davaineidae Fuhrmann, 1907

Subfamily – Ophryocotylinae Fuhrmann, 1907

Genus – Ophryocotyloides Fuhrmann, 1920

Species – Ophryocotyloides choprai n. sp.

(Figs. 1-5, PP 63 )

Out of eleven Rugel, Anthus novaeseelandia (Gmelin), examined at Jhansi, four were found infected with the eight cestodes in their intestines. The morphological studies revealed them to belong to the genus Ophryocotyloides Fuhrmann, 1920 subfamily Ophryocotylinae Fuhrmann, 1907; family Davaineidae Fuhrmann, 1907.

Cestodes measure 48.0-54.0 (51.0) in length and 1.110 in maximum breadth as seen in the gravid proglottids. Proglottids broader than long and craspedote.

Scolex measures 0.120-0.0192x0.168-0.270 (0.156x0.219). Suckers armed, oval to round measures 0.054-0.090x0.030-0.072 (0.072x0.051). Sucker spines measure 0.0032-0.0048 (0.041) in length, arranged in 4-6 rows. Rostellum oval or disc shaped measures 0.072-0.096x0.114-0.192 (0.084-0.133). Rostllum bears 210-280 (245) rostellar hooks, arranged in two alternating rows, each row measure 0.0048-0.0080 (0.0064) in length.

Neck measures 0.870-0.972x0.198-0.216 (0.921-0.207). Immature proglottids measure 0.024-0.048x0.228-0.372 (0.036-0.301), mature proglottids, measure 0.054-0.096x0.396-0.570 (0.075x0.483) and gravid proglottids measure 0.042-0.096x0.690-1.110 (0.069x0.911).

Testes 18-30 (24) in number, oval to round lateral to female genitalia. Testes measures 0.006-0.015x0.009-0.021 (0.011x0.015) and do not extend beyond the limits of ventral longitudinal excretory canals. Cirrus pouch oval to club shaped, measure 0.048-0.066x0.012-0.030 (0.057x0.021), not reaching upto the poral ventral longitudinal excretory canal. Internal and external seminal vesicles absent.

Female genitalia slightly aporal. Ovary bilobed measures 0.012-0.030x0.054-0.084 (0.0211x0.070). Vitelline gland compact, postovarian, 0.004-0.009x0.012-0.024 (0.007x0.018). Vagina posterior to cirrus pouch measure 0.006-0.012 (0.009) in diameter. Receptaculum seminis measures 0.030-0.048x0.006-0.018 (0.036x0.012).

Genital atrium measures 0.018-0.024 (0.021) wide and 0.012-0.015 (0.013) deep. Genital pores unilateral, located in the anterior half of the proglottids margin.

Uterus sac like, persistant measures 0.048-0.072x0.570-0.690 (0.060x0.630), uterus with in the limits of ventral longitudinal excretory canals. Eggs

measure 0.0080–0.0144x0.0080–0.0128 (0.0112x0.0104). Onchoshperes measure 0.0064–0.0096x0.0064–0.0096 (0.0080x0.008).

Ventral longitudinal excretory canals measure 0.006–0.018 (0.012) in diameter.

## Discussion

A comparison of the present form with the reported species of the genus reveals its closeness to Ophryocotyloides baruasagari Tiwari (Unpublished thesis), 1997; Ophryocotyloides corvorum Gupta and Grewal, 1971; Ophryocotyloides SharmaiGupta and Grewal 1971 and Opryocotyloides Srinagarensis Malhotra and Capoor, 1979.

However, it differs from Ophryocotyloides baruasagari Tiwari, 1997 in having smaller scolex. smaller suckers, lesser number of smaller sucker spines row, greater number of smaller testes arranged in two lateral fields, smaller cirrus pouch, smaller ovary, smaller vitelline gland, presence of receptaculum seminis, smaller eggs and smaller Onchospheres. From Ophryocotyloides corvorum Gupta and Grewal, 1971 in having smaller worms, smaller scolex without spiny surface, greater rows of smaller suckers spines, wider rostellum, larger number of smaller testes, smaller ovary, smaller vitelline gland, absence of internal seminal vesicle, presence of receptaculum seminis.

Smaller eggs and smaller Onchoshperes. From Ophryocotyloides Sharmai Gupta and Grewal, 1971 it differs in having smaller worms, narrower scolex without spiny surface, smaller rostellar hooks, lesser number of smaller testes, smaller cirrus pouch, smaller vitelline gland and absence of internal seminal vesicle. From Ophryocotyloides Srinagarensis Malhotra and Capoor, 1979 it differs in having smaller worms, smaller suckers, larger rostellar hooks, fewer testes in two groups, smaller cirrus pouch, smaller ovary, smaller vitelline gland, absence of internal seminal vesicle.

It is proposed to accommodate the present form as a new species, Ophryocotyloides choprain. sp. The species is named in honour of Dr A.K.Chopra Head of Zoology Department of Gurukul Kangri University, Haridwar (U.P.) India.

Host : Anthus novaeseelandiae (Gmelin)

Habitat : Intentine

Locality : Jhansi

Holotype : Department of Zoology, Bipin Bihari (P.G.) College, Jhansi.

Table 4

Comparison of the characters of the species closer to Ophryocotyloides chopraii n. sp.

| | O. haruesagari Tewari 1987 | O.curvorum Gupta and Grewal 1971 | O. sharmai Gupta and Grewal 1971 | O.srinagarensis Malhotra and Capoor 1979 | O.chopraii n. sp. |
|---|---|---|---|---|---|
| Size | 35-45x1.25 | 72-122x1.74 | 109x4.2 | 85-129x2.436 | 48.0-54.0x1 |
| Scolex | 0.21-0.225x 0.105-0.45 | 0.17-0.33x 0.27-0.45 with spiny surface | 0.18x0.36 with spiny surface | 0.16-0.21x 0.23-0.30 | 0.135-0.192x 0.168-0.270 |
| Sucker Spines | | | | | |
| Row | 8-10 | 3-1 | 5-7 | 3-5 | 4-6 |
| Size | 0.008-0.0096 | 0.011 | - | 0.004-0.009 | 0.003-0.004 |
| Rostellum (Width) | 0.075-0.12 | 0.09-0.14 | 0.120 | 0.106-0.199 | 0.114-0.192 |
| Rostellar hooks | | | | | |
| Number | 230-240 | 250-300 | 300 | 200-250 | 210-280 |
| Row | 2 | 2 | 2 | 2 | 2 |
| Size | 0.006-0.0075 | 0.014-0.015 | 0.012-0.014 | 0.0135-0.018 | 0.0048-0.0080 |
| Testes | | | | | |
| Number | 7-18 | 21-25 | 30-35 | 25-51 | 18-30 |
| Size | 0.03-0.06 | 0.036-0.045 | 0.062-0.072 | 0.007-0.058 | 0.006-0.015x 0.009-021 |
| Arrangement | posterolateral to female genitalia | in 2 groups | in 2 groups | in single group | in 2 groups |
| Cirrus Pouch | 0.09-0.13x0.0445-0.05 | 0.106-0.135x 0.042-0.067 | 0.12-0.13x 0.034-0.036 | 0.021-0.153x 0.007-0.04 | 0.048-0.066x 0.012-0.030 |

Ophryocotyloides choprai n. sp.

| | | |
|---|---|---|
| Fig 1 | Scolex with neck | (10x10) |
| Fig 2 | Rostellar hooks | (10x45) |
| Fig 3 | Mature proglottid | (10x10) |
| Fig 4 | Gravid proglottid | (10x10) |
| Fig 5 | Egg | (10x45) |

Abbreviations :- CP, cirrus pouch; E, egg; GA, genital atrium; N, neck; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook; RS, receptaculum seminis; S, sucker; SC, scolex; SS, sucker spine; T, testes; U, uterus; V, vagina; VG, vitelline gland; VLEC, ventral longitudinal excretory canal. .pa

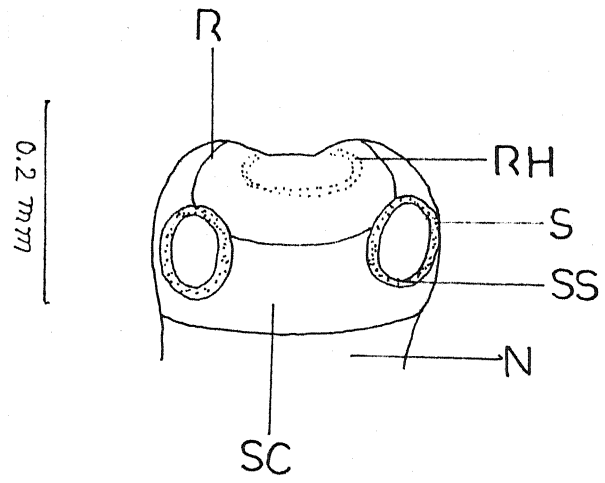



Fig 1

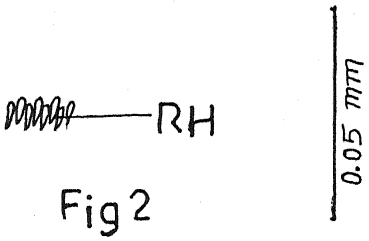



Fig 2

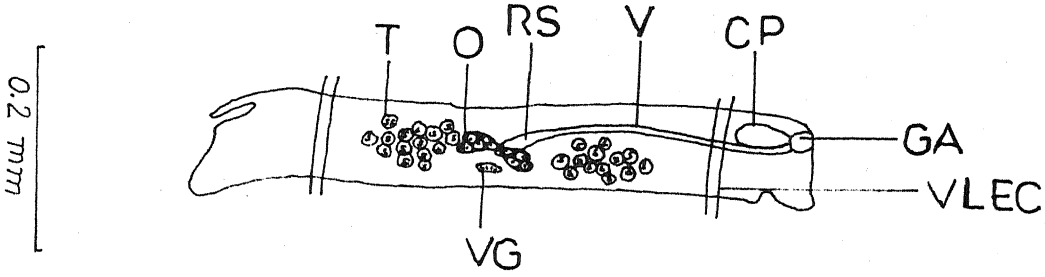



Fig 3

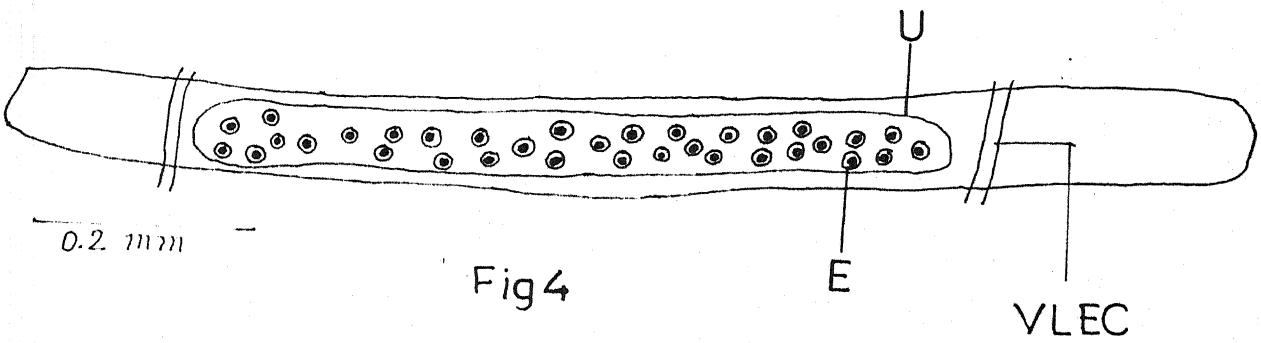



Fig 4

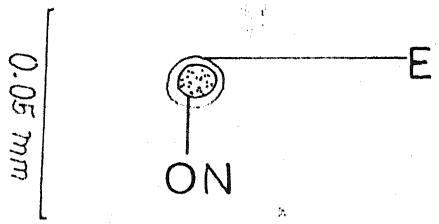



Fig 5

*Ophryocotyloides choprai* n.sp.

Family - Davaineidae Fuhrmann, 1907

Subfamily - Davaineinae Braun, 1900

Genus - RaillietinaFuhrmann, 1920

subgenus - RaillietinaFuhrmann, 1920

Species - Raillietina (Raillietina) jabalpurensisn.sp.

(Figs. 1-5, PP 71 )

Two, out of eleven domestic fowls, Gallus gallus (Linnaeus), harboured twelve cestodes in its intentines. Morphological studies of the cestodes revealed them to belong to the subgenus Raillietina Fuhrmann, 1920 of the genus RaillietinaFuhrmamm 1920; subfamily Davaineinae Braun, 1900 and family Davaineidae Fuhrmann, 1907.

Cestodes measures 15-22.2 cm in length and 1.275 in maximum width as seen in the gravid proglottids. Proglottids broader than long and craspedote.

Scolex measures 0.148-0.228x0.124-0.146 (0.188x0.135). Suckers four, armed, oval shaped measure 0.116-0.140x0.048-0.050 (0.128x0.049). Suckers bear 3-4 rows of sucker spines measure 0.012-0.024 (0.018) in length Rostellum broader than long measures 0.020-0.024x0.060-0.066 (0.022x0.063). Rostellar hooks 210-230 (220) in number arranged in two alternate rows. Rostellar hooks measure 0.0076-0.0112 (0.0104) in length.

Neck prominent measures 2.380-2.720x0.068-0.119

(2.550x0.093). Immature proglottids measure 0.017-0.255x0.119-0.341 (0.136-0.230); mature proglottids measure 0.153-0.595x0.510-1.191 (0.374x0.851) and gravid proglottids measure 0.646-0.935x0.935-1.275 (0.791x1.105).

Testes 13-21 (17) in number, oval to spherical and surrounds the female genitalia within the limits of ventral longitudinal excretory canals. Testes measures 0.024-0.060x0.024-0.060 (0.042x0.042). Vas deferens much coiled measures 0.009-0.024 (0.016) in diameter. Cirrus pouch oval to club shaped measures 0.108-0.144x0.018-0.072(0.126x0.045) not reaches upto the poral ventral longitudinal excretory canal. Internal and external seminal vesicles absent.

Female genitalia situated in the middle of the proglottid or slightly poral. Ovary lobulated measures 0.024-0.084x0.108-0.216 (0.054x0.162). Vitelline gland compact, postovarian measures 0.012-0.036x0.072-0.120 (0.024x0.096). Vagina measures 0.010-0.024 (0.017) in diameter. Vagina opens posterior to the cirrus pouch in the genital atrium. Receptaculum seminis measures 0.062-0.120x0.024-0.060 (0.096x0.042), situated at the proximal end of vagina.

Genital atrium measures 0.010-0.024 (0.017) deep and 0.014-0.036 (0.025) wide. Genital openings unilateral located in the anterior half of the proglottid margin.

Uterus replaced by egg capsules. Egg capsules measures 0.086-0.248x0.048-0.240 (0.167x0.144). Each egg capsule contains 3-7 eggs. Eggs measure 0.012-0.028x0.012-0.036 (0.024x0.018). Onchospheres measure 0.009-0.014x0.009-0.014 (0.012).

Ventral longitudinal excretory canals measure 0.012-0.048 (0.030) in diameter.

## Discussion

The present form comes closer to Raillietina (Raillietina) allomyodes(Kotlan, 1921) Fuhrmann, 1924; Raillietina (Raillietina) angusta Ortlepp, 1963; Raillietina (Raillietina) daetansis Tubangai & Masilungen, 1937; Raillietina (Raillietina) gendrei (Joyeux, 1923) Fuhrmann, 1924; Raillietina (Raillietina) michaelseni Baer, 1925; Raillietina (Raillietina) peradenica Bawada, 1957 and Raillietina (Raillietina) vogeli Hilmy 1936.

The present form differs from R. (R.) allomyodes (Kotlan, 1921) Fuhrmann, 1924 in having larger worms, narrower scolex, narrower suckers, greater number of sucker spines, greater number of smaller rostellar hooks and greater number of testes. From R. (R.) angusta Ortlepp, 1963 in having larger worms, narrower neck, narrower scolex, narrower suckers, lesser number of sucker spines, narrower rostellum, lesser number of smaller rostellar hooks, smaller cirrus pouch, lesser

number of testes and greater number of egg capsules. From R. (R.) daetensisTubangai & Masilungen, 1937 in having narrower worms, narrower scolex, narrower sucker, lesser rows of sucker spines, narrower rostellum, greater number of smaller rostellar hooks, smaller cirrus pouch, greater number of smaller testes. From R. (R.) gendrei(Joyeux, 1923) Fuhrmann, 1924 in having narrower worms, narrower suckers, smaller sucker spines, narrower rostellum, smaller cirrus pouch, greater number of larger testes and larger number of eggs per egg capsule. From R. (R.) michaelseni Baer, 1925 in having wider worms, narrower scolex, narrower suckers, lesser rows of larger sucker spines, narrower rostellum, lesser number of smaller rostellar hooks, longer cirrus pouch, wider testes and greater number of eggs per egg capsule. From R. (R.) peradenica Sawada, 1957 in having narrower worms, narrower neck, narrower scolex, narrower suckers, greater rows of sucker spines, narrower rostellum greater number of testes, lesser number of eggs per egg capsule and smaller onchospheres. From R. (R.) vogeliHilmy, 1936 in having narrower worms, narrower neck, narrower scolex, narrower suckers, lesser rows of smaller sucker spines, narrower rostellum, lesser number of smaller rostellar hooks, smaller cirrus pouch and smaller eggs.

In the light of the above discussion it is proposed to accommodate the present form as a new

species, Raillietina (Raillietina) jabalpurensisn. sp.

Host : Gallus gallus(L)

Habitat : Intestine

Locality : Jabalpur (M.P.)

Holotype : Department of Zoology,
Bipin Bihari (P.G.) College, Jhansi

TABLE 5

Comparison of the characters of the species closer to Raillietina (R.) Jabalpurensis n. sp.

| | | R. (R.) allomyodes (Kotlan, 1921) Fuhrmann, 1924 | R. (R.) angusta Ortlepp, 1963 | R. (R.) daotensis Tubangai & Musilungen, 1937 | R. (R.) gendrie (Joyeux, 1923) Fuhrmann, 1924 | R. (R.) michaeleni Baer (1925) | R. (R.) peradenica sawada, 1957 | R. (R.) vogeli Hilmy, 1936 | R. (R.) jabalpurensis n. sp. |
|---|---|---|---|---|---|---|---|---|---|
| Srtobila | L | 60 mm | 100-200 mm | 175 mm | 120 mm | 100-223 mm | 230 mm | 20 mm | 15-22.2 cm |
| | W | 540-750 | 680--1000 | 3700 | 1500 | 270-820 | 1500-2200 | 2090 | 1.275 |
| Neck | W | - | 200-240 | - | - | - | 270 | 290 | 0.0680.119 |
| Scolex | W | 255 | 270-300 | 400 | - | 260-420 | 580 | 380-470 | 144-176 |
| Sucker | D | 78 | 90-150 | 90-100 | 80-85 | 76 | 119-149 | 165-190 | 0.048-0.050 |
| Spine | R | - | Several | 6-7 | - | 5-8 | 7-10 | 20 | 3-4 |
| | L | - | - | 11.5-14 | 14 | 8 | - | 10 | 0.012-0.024 |
| Rost | W | - | 75 | 130 | 75 | 80 | 104-149 | 180 | 0.060-0.066 |
| hook | N | 160-200 | 200 | 190 | 210 | 200-300 | 200 | 150-200 | 210-290 |
| | R | - | 2 | 2 | - | 2 | 2 | 2 | |
| | L | 17-18 | 9 | 23-31 | 9-10.5 | 12.8-16.5 | 12 | 35-37 | 0.0076-0.0112 |
| Cir.Pouch | | 120-150 | 150-180 x 45-50 | 170-200 x 60-70 | 170-200 x 60-80 | 87-114 x 76 | 312 | 200 x 80 | 0.108-0.144 x 0.018 |
| Testes No. | | 12-16 | 18-24 | 12-15 | 11-13 | 14-22 | 17-25 | 16-22 | 13-21 |
| Size | | - | - | 60-95 | 43 | 40 | - | - | 60 |
| Egg/Cap. | | 6-7 | 2-5 | 4-8 | 6-8 | 4-6 | 5-9 | 3-6 | 3-7 |
| Egg. | | - | - | - | 25-30 | - | - | 42 | 12-36 |
| Onchospheres | | - | - | - | 12-15 | 15.2 | 20 | 10-15 | 9-14 |
| Em. hook | L | - | - | - | - | | 8 | - | - |

Raillietina (Raillietina) jabalpurensis n.sp.

| | | |
|---|---|---|
| Fig 1 | Scolex with neck | (10x10) |
| Fig 2 | Rostellar hooks | (10x45) |
| Fig 3 | Mature proglottid | (5x10) |
| Fig 4 | Gravid proglottid | (5x10) |
| Fig 5 | Egg capsule | (10x45) |

Abbreviations :- CP, cirrus pouch; E, egg; EC, egg capsule; GA, genital atrium; N, neck; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook; RS, receptaculum seminis; S, sucker; SC, scolex; SS, sucker spine; T, testes; V; vagina; VD, vas deferens; VG, vitelline gland ; VLEC, ventral longitudinal excretory canal.

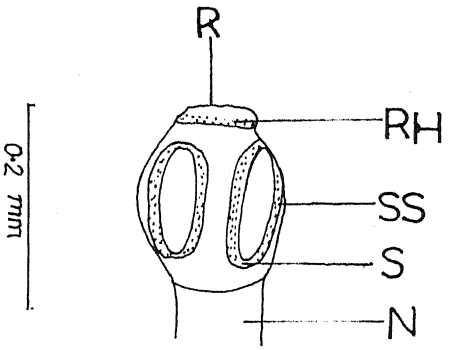



Fig1

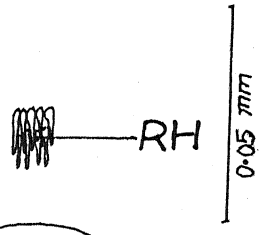



Fig2

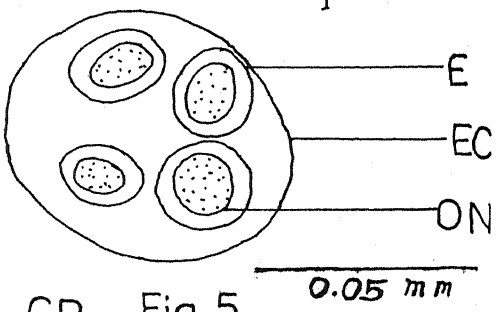



Fig 5

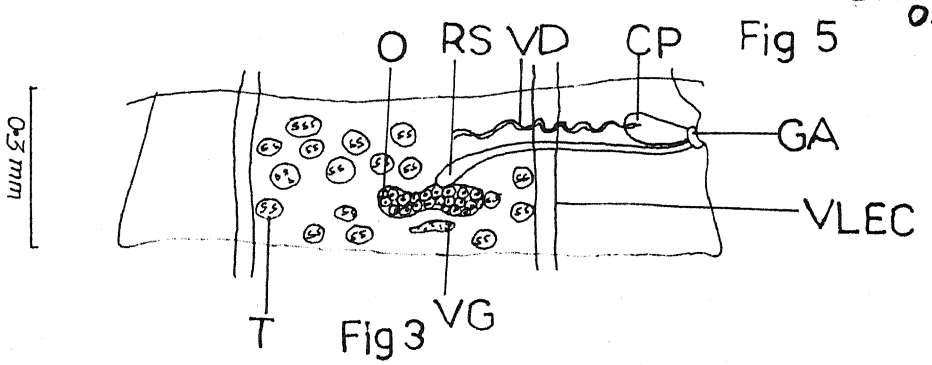



Fig 3

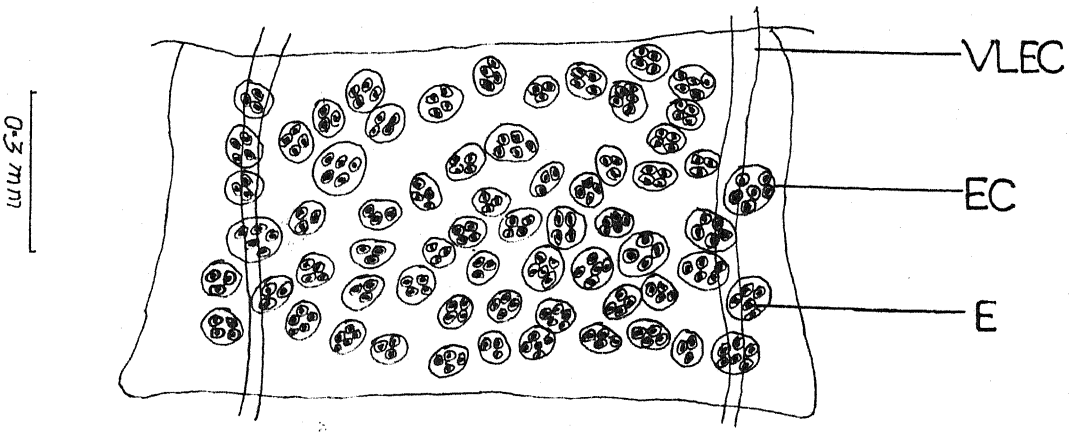



Fig 4

*Raillietina (Raillietina) jabalpurensis* n.sp.

Family – Dilepididae Railliet etHenry, 1909

Subfamily – Dipylidiinae Stiles, 1896

Genus – ChoanotaeniaRailliet, 1896

Species – Choanotaenia sonotiMukherjee, 1964

(Figs. 1-5, PP 76 )

Out of sixteen fowl, Gallus gallus (Linnaeus) examined at Jhansi (U.P.) four were found infected with twenty two cestodes in its intestines. The morphological studies of the cestodes revealed them to belong to the genus ChoanotaeniaRailliet, 1896 of the subfamily Dipylidiinae stiles, 1896; family Dilepididae Railliet etHenry, 1909.

Cestodes measures 62-98 in length and 0.930 in maximum breadth as seen in mature proglottids. Proglottids craspedote. Mature proglottids broader than long and gravid longer than broad.

Scolex measures 0.180-0.346x0.120-0.396 (0.273x0.238). Suckers four, oval to round measure 0.180-0.258x0.090-0.190 (0.219x0.140). Rostellum measures 0.079-0.126x0.042-0.084 (0.102x0.063). Rostellum provided with 12-16 rostellar hooks, arranged in single row. Rostellar hooks measures 0.0480-0.0560 (0.0520) in length. Each rostellar hook contains a handle, 0.0270-0.0288 (0.0230); a guard, 0.0032-0.0040 (0.0036) and a blade, 0.0240-0.0256 (0.0248) in length.

Neck prominent measures 0.450–0.540x0.180–0.290 (0.501x0.240). Immature proglottids measure 0.018–0.294x0.246–0.402 (0.156x0.324); mature proglottids measure 0.432–0.510x0.504–0.930 (0.471x0.717) and gravid proglottids measure 0.450–0.540x0.414–0.642 (0.495x0.528).

Testes 14–21 (17) in number oval to round, posterior to ovary measures 0.018–0.042x0.030–0.066 (0.036x0.048), which never extend beyond the limits of the ventral longitudinal excretory canals. Cirrus pouch club shaped measure 0.054–0.084x0.018–0.042 (0.069x0.030) which never reaches upto ventral longitudinal excretory canal. Internal and external seminal vesicles absent.

Female genitalia single and medial. Ovary bilobed measures 0.030–0.096x0.222–0.373 (0.066x0.297). Vitelline gland post ovarian measures 0.012–0.042x0.042–0.132 (0.027x0.087). Receptaculum seminis absent. Vagina measures 0.006–0.012 (0.009) in diameter.

Genital atrium measures 0.012–0.024 (0.018) in deep and 0.018–0.030 (0.024) wide. Genital openings irregularly alternate located in the anterior half of the proglottids margin.

Uterus breaks into egg capsules. Egg capsule measures 0.0160–0.0224x0.0176–0.0256 (0.0192x0.0216),

extend laterally beyond the limits of the ventral longitudinal excretory canals. Each egg capsule contains single egg measuring 0.0096-0.0160x0.0096-0.0144 (0.0128x0.0120). Onchoshperes measure 0.128-0.0144x0.0128-0.0141 (0.0136-0.0136).

Ventral longitudinal excretory canals measure 0.006-0.018 (0.012) in diameter.

## Discussion

A comparison of the present form with the reported species of the genus Choanotaenia Railliet 1896 reveals it to represent Choanotaenia sonoti Mukherjee, 1964. The minor differences between the numbers of rostellar hooks, genital organs, location of genital pore. The above description of the form which in author's opinion resembles closely with the description of Choanotaenia sonotiMukherjee.

Hence this is detailed description of Choanotaenia sonotiMukherjee 1964.

Host : Gallus gallus(L)

Habitat : Intestine

Locality : Jhansi

Holotype : Department of Zoology,
Bipin Bihari (P.G.) College,
Jhansi. (U.P.)

Choanotaenia sonotiMukherjee, 1964

| | | |
|---|---|---|
| Fig 1 | Scolex | (10x10) |
| Fig 2 | Rostellar hook | (10x45) |
| Fig 3 | Mature proglottid | (10x10) |
| Fig 4 | Gravid proglottid | (10x10) |
| Fig 5 | Egg capsul | (10x45) |

Abbreviations :- B, blade; CP, cirrus pouch; E, egg; EC, egg capsule; G, guard; GP, genital pore; N, neck; O, ovary; R, rostellum; RH, rostellar hook; SS, receptaculum seminis; S, sucker; SC, scolex; T, testes; V, vagina; VD, vitelline deferens; VG, vitelline gland; VLEC, ventral longitudinal excretory canal.

Choanotaenia sonotiMukherjee, 1964

| | | |
|---|---|---|
| Fig 1 | Scolex | (10x10) |
| Fig 2 | Rostellar hook | (10x45) |
| Fig 3 | Mature proglottid | (10x10) |
| Fig 4 | Gravid proglottid | (10x10) |
| Fig 5 | Egg capsul | (10x45) |

Abbreviations :- B, blade; CP, cirrus pouch; E, egg; EC, egg capsule; G, guard; GP, genital pore; N, neck; O, ovary; R, rostellum; RH, rostellar hook; RS, receptaculum seminis; S, sucker; SC, scolex; T, testes; V, vagina; VD, vitelline deferens; VG, vitelline gland; VLEC, ventral longitudinal excretory canal.

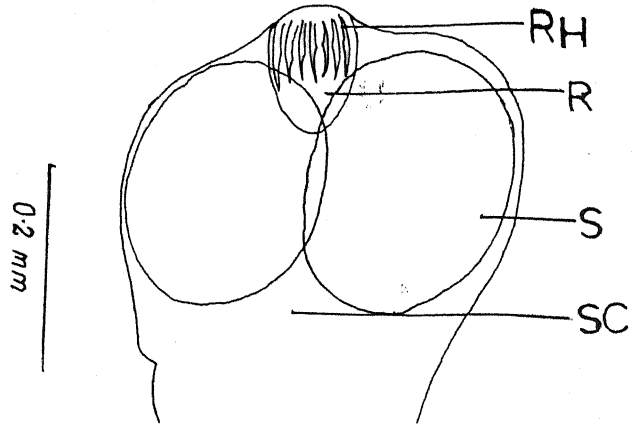



Fig 1

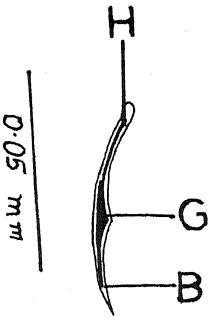



Fig 2

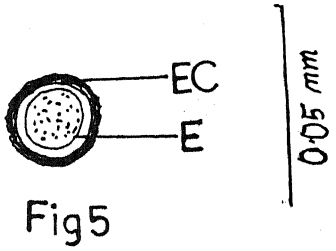



Fig 5

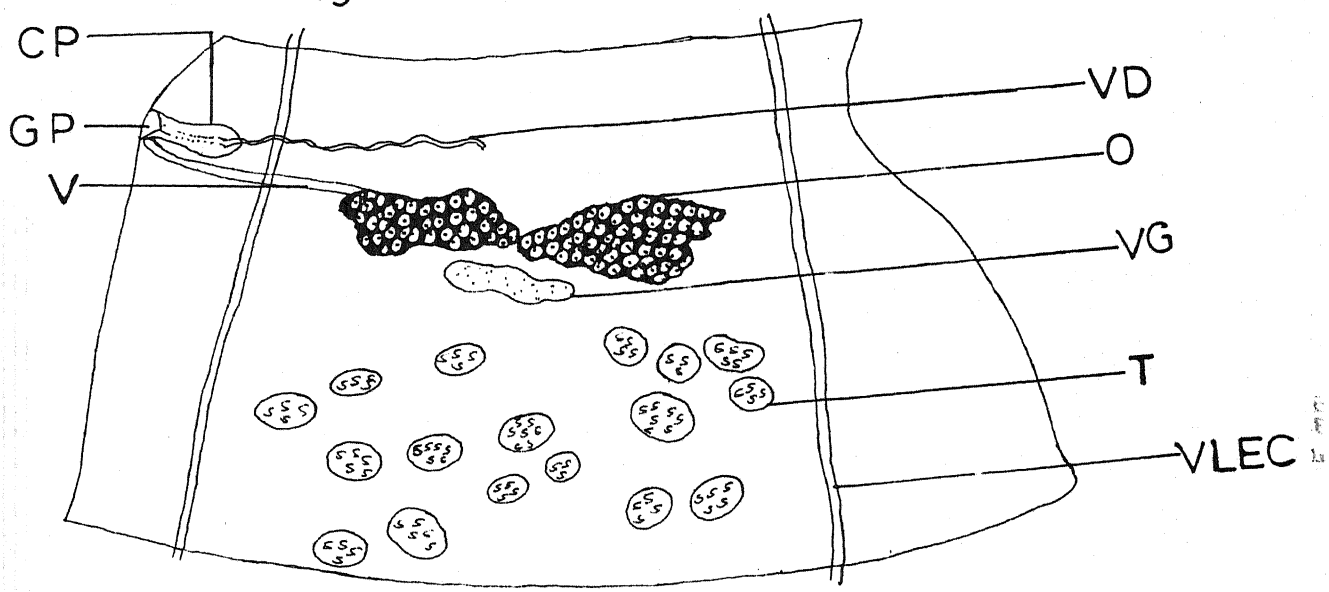



Fig 3

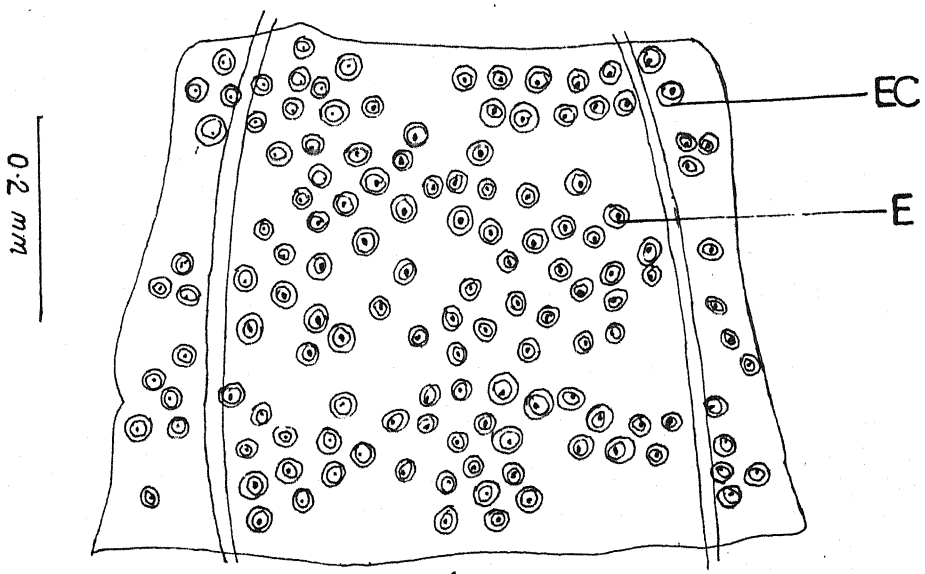



Fig 4

Family – Dilepididae Railliet et-Henry, 1909

Subfamily – Dilepidinae Fuhrmann, 1907

Genus – Jalpain.g.

Species – Jalpai sipriensisn. g., n. sp.

(Figs. 1-5, PP 84 )

Nine little grebs, Podiceps ruficollis (P) were examined at Barauasagar, District Jhansi (U.P.), two were found infected with three cestodes. Morphological studies of the cestodes revealed them to belong to the genus Jalpai n.g. of the subfamily Dilepidinae Fuhrmann, 1907 and family Dilepididae Railliet et Henry, 1909.

Jalpai n.g.

Generic diagnosis

Large sized worms with two sets of reproductive organs per proglottid. Scolex with four unarmed suckers. Rostellum bears a single circle of rostellar hooks. Neck absent. Testes numerous in two groups. Cirrus pouch crosses the ventral longitudinal excretory canals. Internal seminal vesicles present. External seminal vesicle absent. Cirrus armed. Genital pores opens in anterior half of the proglottid margin. Ovary bilobed vitelline gland postovarian, compact. Uterus sac like extend beyond the limits of ventral longitudinal excretory canals. Parasites of aquatic birds.

Jalpai sipriensisn.g., n. sp.

Cestodes measures 140-154 in length and 3.060 in maximum width as seen in gravid proglottids. The strobila consists of a large number of craspedote and broader than long proglottids.

Scolex measures 0.496-0.509x0.704-0.936 (0.502x0.791). Suckers measure 0.159-0.169x0.195-0.219 (0.164-0.207). Armed rostllum longer than broad measures 0.398-0.471x0.322-0.351 (0.435x0.337). Rostellum bears 12 large rostellar hooks, arranged in single row. Rostellar hooks measure 0.264-0.288 (0.276) in length. Rostellar hooks contain a handle, 0.168-0.180 (0.174); a blade, 0.084-0.108 (0.096) and a guard 0.012-0.024 (0.018) in length.

Neck absent. Immature proglottids measure 0.017-0.051x0.731-0.952 (0.034x0.842); mature proglottids measure 0.034-0.551x.986-2.975 (0.451x1.990) and gravid proglottids measure 0.681-1.270x1.981-3.060 (0.981x2.521).

Genitalia double per proglottid. Testes 32-60 in number, oval to round distributed in two groups within the limits of the ventral longitudinal excretory canals. Testes measures 0.034-0.068x0.034-0.085 (0.051x0.060). Cirrus pouch cylindrical measures 0.340-0.935x0.034-0.204 (0.637x0.119), crosses the ventral

longitudinal excretory canal. Internal seminal vesicles measure 0.153-0.356x0.015-0.170 (0.255x0.110). External seminal vesicle absent. Cirrus prominent measures 0.068-0.589x0.017-0.152 (0.329x0.095), cirrus spines in 8-18 rows measures 0.0042-0.0126 (0.0084) in length.

Female genitalia double per proglottid. Ovary two, bilobed measure 0.034-0.065x0.085-0.168 (0.049x0.0127). Vitelline glands post ovarian measure 0.017-0.034x0.018-0.061 (0.026x0.039). Vagina measures 0.021-0.036 (0.029) in diameter, opens posterior to cirrus pouch in the genital atrium. Receptaculum seminis measures 0.060-0.096x0.017-0.060 (0.078x0.039).

Genital atrium measures 0.048-0.159 (0.104) deep and 0.060-0.169 (0.112) wide. Genital opening bilateral located in the anterior half of the proglottid margin. Male and female organs present only in anterior proglottids.

Uterus sac like measures 0.5580-0.675x1.119-1.890 (0.617x1.505), extend beyond the limits of the ventral longitudinal excretory canals. Eggs measure 0.016-0.042x0.018-0.039 (0.029x0.029). Onchospheres measure 0.012-0.018x0.012-0.018 (0.014x0.014).

Ventral longitudinal excretory canals measure 0.012-0.036 (0.024) in diameter.

## Discussion

The present worms on the basis of circle of rostellar hooks, number of Proglottids, disposition of testes and shape of uterus vary from the other genera of the family Dilepididae Railliet etHenry, 1909. But comes slightly closer to MirandulaSandars, 1956.

It differs from MirandulaSandars, 1956 in having larger worms, single circle of rostellar hooks, strobila consisting of numerous segments, numerous testes in two groups, cirrus pouch crosses the poral ventral longitudinal excretory canal, absence of internal seminal vesicle, different location of genital pores, bilobed ovary, uterus sac like and parasites of birds.

In the light of above discussion it is proposed to accommodate the present form as a new genus Jalpain.g. and a new species, Jalpai sipriensisn.g., n. sp.

The genus is named after Shri Jalpa Prasad Srivastava eminent social worker of Amethi district Sultanpur (U.P.) India.

Host : Podiceps ruficollis(P)

Habitat : Intestine

Locality : Banwasgar, Jhansi

Holotype : Department of Zoology, Bipin Bihari (P.G.) College, Jhansi.

Table 6

Comparison of the characters of the various genera closer to Jalpain.g.

| | Mirandula Sandars 1956 | Jalpain.g. |
|---|---|---|
| Size | Very small worm | Very long worm |
| Rostellar hook | Double circle | Single circle |
| Strobila | Consisting only a few segments | Consisting a numerous segments |
| Testes | Usually in two groups of four, lateral to median line | numerous in single group |
| Cirrus pouch | Reaching poral canal | Crosses the poral canal |
| Internal seminal vesicle | Absent | Present |
| Ovary | Compact, anterior to testes | Bilobed, surrounds the testes |
| Uterus | Slightly bilobed | Simple sac like |

## Key to the geners of the sub family Dilepidinae Fuhrmann, 1907

1a. Two sets of reproductive organs per segment, double circle of rostellar hooks, a few segments, testes in two groups of four, cirrus pouch reaches upto poral canal, uterus transverse sac later on slightly bilobed ..... Mirandula

1b. Two sets of reproductive orgnas per segment, single circle of rostellar hooks, numerous segments, numerous testes in two groups cirrus pouch crosses the poral canal, uterus transverse sac later on simple sac like ..... Jalpain.g.

Jalpai sipriensisn.g., n. sp.

Fig 1 Scolex (5x10)

Fig 2 Rostellar hook (10x10)

Fig 3 Mature proglottid (5x10)

Fig 4 Gravid proglottid (5x10)

Fig 5 Egg (10x45)

Abbreviations :- B, blade; C, cirrus ; CP, cirrus pouch; CS, cirrus spine; E, egg; G, guard; GA, genital atrium ; H, handle; IVS, internal seminal vesicle; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook; RS, receptaculum seminis; S, sucker; SC, scolex; T, testes; V, vagina; U, uterus; V, vagina; VG, vitelline gland; VLEC, ventral longitudinal excretory canal.

Jalpai sipriensisn.g., n. sp.

Fig 1 Scolex (5x10)

Fig 2 Rostellar hook (10x10)

Fig 3 Mature proglottid (5x10)

Fig 4 Gravid proglottid (5x10)

Fig 5 Egg (10x45)

Abbreviations :- B, blade; C, cirrus ; CP, cirrus pouch; CS, cirrus spine; E, egg; G, guard; GA, genital atrium ; H, handle; IVS, internal seminal vesicle; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook; RS, receptaculum seminis; S, sucker; SC, scloex; T, testes; V, vagina; U, uterus; V, vagina; VG, vitelline gland; VLEC, ventral longitudinal excretory canal.

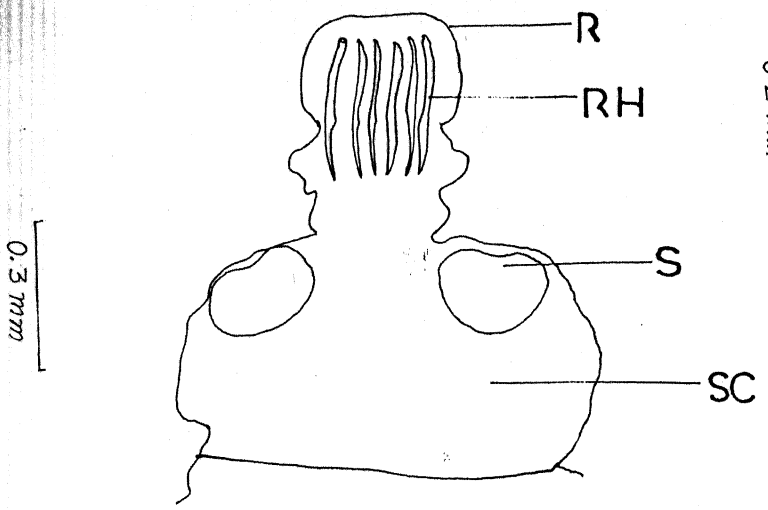



Fig 1

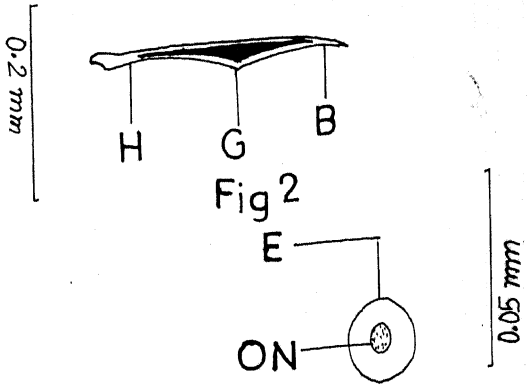



Fig 2

Fig 5

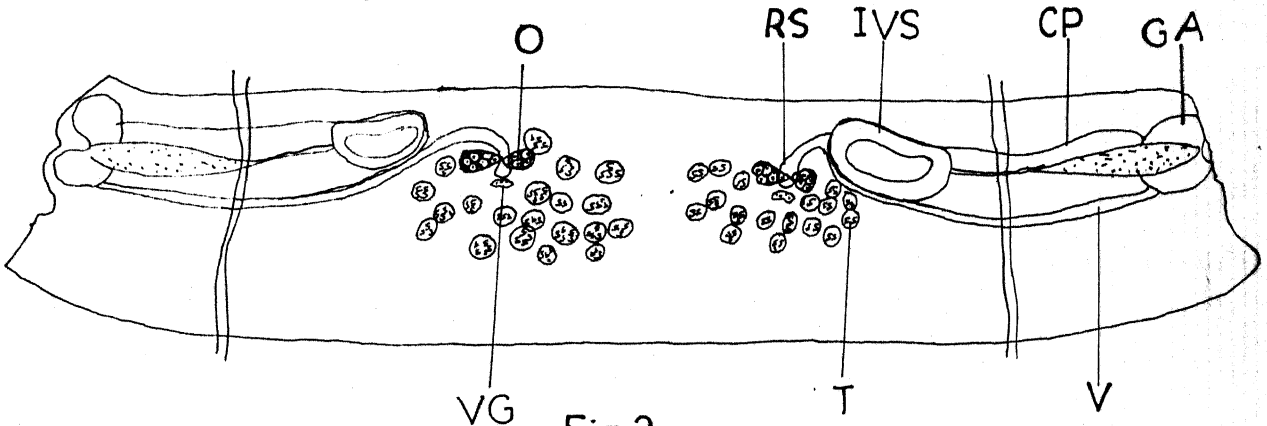



Fig 3

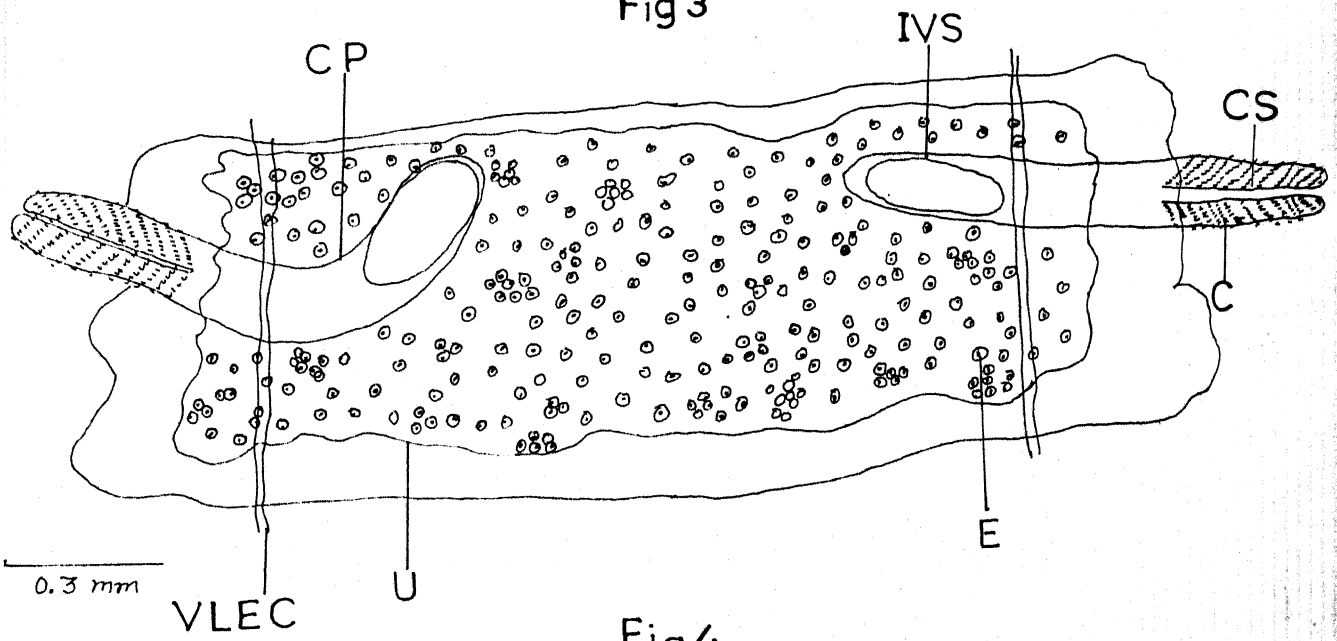



Fig 4

*Japlai sipriensis* n.g., n.sp.

Family - Dilepididae Railliet etHenry, 1909

Subfamily - Dilepidinae Fuhrmann, 1907

Genus - Raksian.g.

Species - Raksia pycnonotusn.g., n.sp.

(Figs. 1-5, PP 93 )

Two out of six redvented bulbul Pycnonotus cafer (Linn.) examined at Raksa, Distt. Jhansi (U.P.), harboured four cestodes in its intestines. The morphological studies of the cestodes revealed them to belong to the genus, Raksian.g. and a new species Raksia pycnonotus n.g., n.sp. of the subfamily Dilepidinae Fuhrmann, 1907, family Dilepididae Railliet etHenry, 1909.

## Amended diagnosis of the subfamily Dilepidinae

Internal and external seminal Vesicles absent. Testes in two lateral fields. Cirrus unarmed, vitelline gland compact. Uterus persistant, Genital openings unilateral.

Raksian.g.

**Generic diagnosis :-** Medium sized worms, single set of reproductive organs. Proglottids craspedote. Testes numerous in two lateral fields with in the limits of ventral longitudinal excretory canals. Cirrus pouch oval, elongated. Internal and external seminal vesicles

absent. Ovary bilobed. Vitelline gland postovarian genital pores unilateral. Uterus sac like. Parasites of aquatic birds.

Raksia pycnonotusn.g., n.sp.

Cestodes measures 13-17 in length and 0.93 in maximum width. Proglottids broader than long and craspedote.

Scolex measures 0.09-0.195x0.09-0.225 (0.143x0.159). Suckers four, unarmed, oval to round measures 0.075-0.150x0.060-0.135 (0.113x0.098). Rostellum broader than long measures 0.027-0.030x0.09-0.12(0.029x0.11). Rostellar hooks 50-60 (55) in number, arranged in single row. Rostellar hooks measure 0.016-0.024 (0.019) in length. Each rostellar hook contains a handle, 0.0058; a guard 0.0042 and a blade 0.0042 in length.

Neck prominent, measures 0.645-0.825x0.150-0.190 (0.735x0.165). Immature proglottids measure 0.015-0.075x0.15-0.21 (0.045x0.18); mature proglottids measure 0.105-0.225x0.27-0.52 (0.165x0.401) and gravid proglottids measure 0.15-0.22x0.54-0.93 (0.19x0.74).

Testes 15-25 (20) in two lateral fields; Poral group contains 3-7, while aporal group 12-17 measures 0.0075-0.037x0.0075-0.030 (0.02x0.02); extend laterally with in the limits of ventral longitudinal excretory

canals. Cirrus pouch oval measures 0.06–0.09x0.022–0.015 (0.08x0.019), crosses the poral ventral longitudinal excretory canal. Vas deferens measures 0.045–0.075 (0.060) in diameter. Internal and external seminal vesicles absent.

Female genitalia medial. Ovary bilobed measures 0.045–0.090x0.015–0.060 (0.070x0.038). Vitelline gland compact, postovarian measures 0.015–0.037x0.015–0.030 (0.026x0.023). Vagina measures 0.0075–0.015 (0.011) in diameter, opens posterior to cirrus pouch in the genital atrium. Receptaculum seminis measures 0.022–0.037x0.015–0.030 (0.030x0.023), situated at the proximal end of Vagina.

Genital atrium 0.015–022 (0.019) in deep and 0.015–0.030 (0.023) in wide. Genital openings unilateral, located in the anterior half of the proglattids.

Uterus sac like measures 0.135–0.225x0.375–0.401 (0.165x0.480), with in the limits of ventral longitudinal excretory canals. Eggs measure 0.022–0.06x0.022–0.06 (0.040). Onchospheres measures 0.0024–0.0030 (0.0029).

Ventral longitudinal excretory canals measure 0.015–0.037 (0.026) in diameter.

## Discussion

According to Schmidt, 1986 the cestodes belong to the family Dilepididae Railliet etHenry, 1909. On the basis of location of genital atrium, disposition of testes and absence of internal and external seminal vesicles. The present form comes closer to Pseudandrya Fuhrmann, 1943 and LateriporusFuhrmann, 1907.

The present form differs from Pseudandrya Fuhrmann, 1943 and LateriporusFuhrmann, 1907 in having different arrangement of testes, absence of internal and external seminal vesicles, unarmed cirrus and sac like uterus.

In the light of above discussion it is proposed to accommodate the present form as a new genus Raksian.g. and a new species, Raksia pycnonotusn.g. n.sp.

Host : Pycnonotus cafer(L)

Habitat : Intestine

Locality : Raksa, Distt. Jhansi (U.P.)

Holotype : Department of Zoology, Bipin Bihari (P.G.) College, Jhansi.

Table 7

Comparison of the characters of various genera closer to Raksian.g.

| | Pseudandrya Fuhrmann, 1943 | Lateriporus Fuhrmann, 1907 | Raksia n.g. |
|---|---|---|---|
| Tests | Situated mainly antiporal | Situated mainly postovarian | Situated in two lateral field. |
| Cirrus | Unarmed | Armed | Unarmed |
| Uterus | Reticular | Sac Like | Sac Like |
| Vagina | Posterior to cirrus pouch | Posterior to cirrus pouch | anterior to cirrus pouch |

Key to genera in dilepidinae

1a Two sets of reproductive organs per segment .... Miranoula

1b One set of reproductive organs per segment .... 2

2a Genital pores unilateral .... 3

2b Genital pores alternating .... 22

3a Rostellum lacking ...Arctotaenia

3b Rostellum present ... 4

4a Genital pores submarginal ... 5

4b Genital pores marginal ... 6

5a One circle of rostellar hooks, rostellum slightly bifurcated at tip... Trichocephaloidis

5b Two circles of rostellar hooks, rostellum not bifurcated . .... Vogea

6a Genital atrium very large, deep and muscular ..... 7

6b Genital atrium not as above ..... 9

7a Genital atrium complex, with spines, bristles or diverticulae ....Neogryporhynchus

7b Genital atrium muscular but not as above ..... 8

8a Entire genital atrium muscular .....Valipora

8b Genital atrium muscular only at proximal end .....Mashonalepis

9a One circle of rostellar hooks ..... 10

9b Two circles of rostellar hooks ..... 11

10a Testes mainly antiporal uterus reticular .....Pseudandrya

10b Testes mainly postovarian uterus sac like .....Lateriporus

10c Testes in two fields on lateral side of ovary, but not postovarian, uterus sac like .....Raksian.g.

Raksia pycnonctusn.g. n.sp.

| | | |
|---|---|---|
| Fig 1 | Scolex | (10x10) |
| Fig 2 | Rostellar hooks | (10x45) |
| Fig 3 | Mature proglottid | (10x10) |
| Fig 4 | Gravid proglottid | (10x10) |
| Fig 5 | Egg | (10x45) |

Abbreviations :- B, blade; CP, cirrus pouch; E, egg; G, guard; GA, genital atrium; H, handle; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook; RS, receptaculum seminis; S, sucker; SC, scolex; T, testes; U, uterus; V, vagina; VD, vas deferens; VG, vitelline gland; VLEC, ventral longitudinal excretory canal.

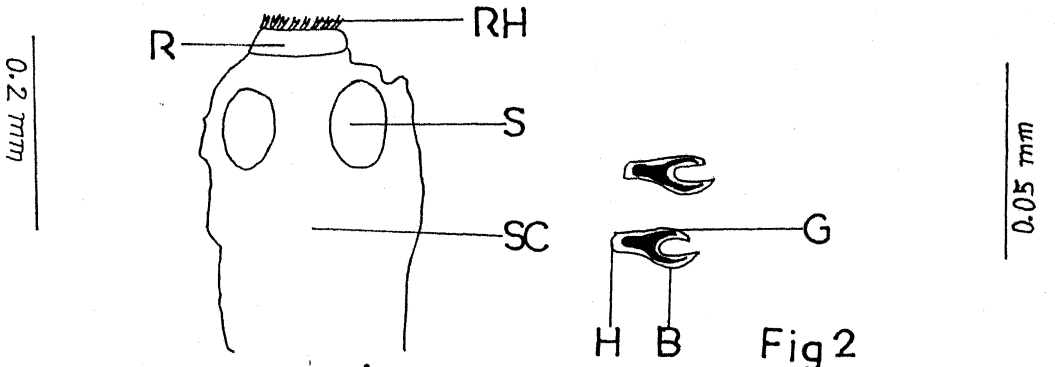



Fig 1 Fig 2

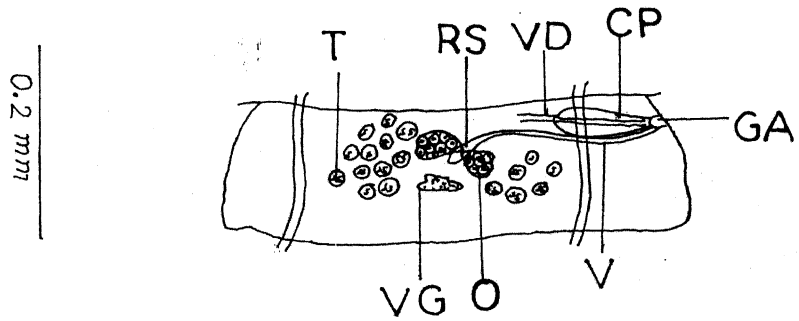



Fig 3

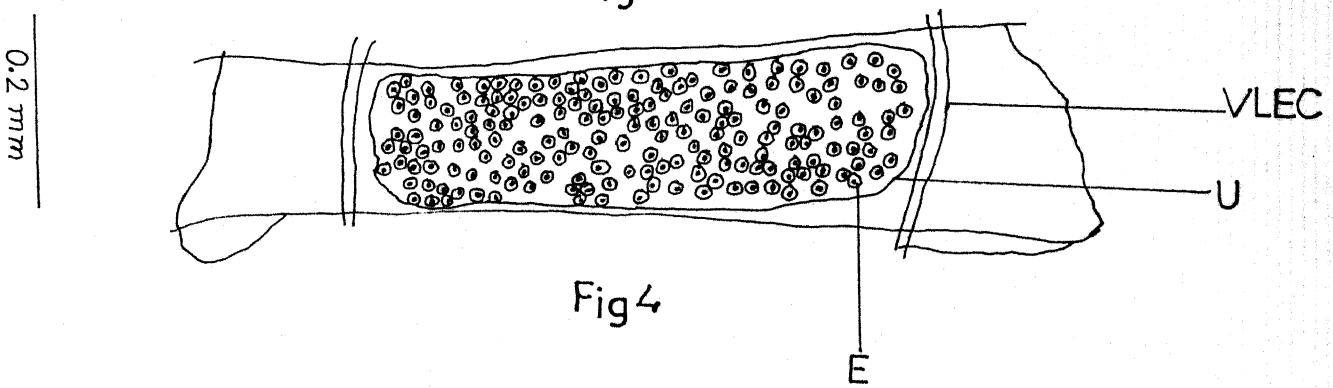



Fig 4

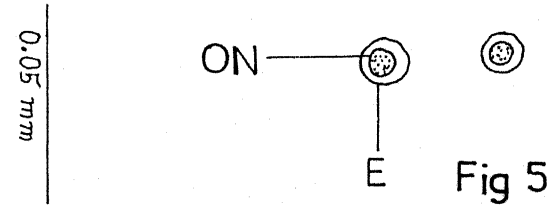



Fig 5

*Raksia pycnonotus* n.g., n.sp.

Family – Dilepididae Railliet etHenry, 1909

Subfamily – Dilepidinae Fuhrmann, 1907

Genus – AmoebotaeniaCohn, 1900

Species – Amoebotaenia gharmauensis n.g., n.sp.

(Figs. 1-6, PP 100 )

Out of seven little grebs, Podiceps ruficollis (Pallas) examined at Gharmau District Jhansi, three were found infected with sixteen cestodes. Cestodes were present in the intestine of the host. The morpological studies of the cestodes revealed them to belong to the genus AmoebotaeniaCohn, 1900 of the subfamily Dilepidinae Fuhrmann, 1907; family Dilepididae Railliet etHenry, 1909.

Cestodes are small in size measuring 3.1-4.0 mm in length and 0.840 in maximum width as seen in the mature proglottids. Proglottids extremely craspedote, broader than long.

Scolex measures 0.108-0.150x0.126-0.210 (0.129x0.168), well demarcated from the neck. Suckers unarmed, oval to round measure 0.051-0.096x0.042-0.078 (0.075x0.060). Rostellum elongated, cylindrical measures 0.081-0.126x0.024-0.042 (0.105x0.033). Rostellar hooks 16-20 in number, arranged in a single row. Rostellar hooks measures 0.0096-0.0144 (0.0120) in length. Each rostellar hook bears a short handle,

0.0016–0.0032 (0.0020); a guard 0.0064–0.0096 (0.0080) and a blade 0.0064–0.0096 (0.0080) n length.

Neck prominent measures 0.006–0.018x0.144–0.192 (0.012x0.168). Immature proglottids measure 0.006–0.018x0.096–0.132 (0.012x0.114); mature proglottids measure 0.012–0.096x0.198–0.840 (0.054x0.519) and gravid proglottids measure 0.108–0.126x0.222–0.288 (0.117x0.255).

Testes 5–9 in number, oval to spherical posterior to ovary. Testes measures 0.012–0.024x0.012–0.024 (0.018x0.018). Cirrus pouch oval measures 0.080–0.138x0.036–0.054 (0.109x0.045), reaches upto the mid of the proglottids width cirrus provided with two rows of spines. Cirrus spine measure 0.033–0.041x0.0008–0.003(0.037x0.002). Internal seminal vesicle measures 0.030–0.048x0.006–0.021 (0.039x0.013) and external seminal vesicle measures 0.048–0.066x0.012–0.030 (0.057x0.021).

Female genitalia median. Ovary measures 0.012–0.024x0.054–0.072 (0.018x0.063). Vitelline gland compact, postovarian measures 0.006–0.012x0.012–0.018 (0.009x0.015). Vagina measures 0.006–0.009 (0.008) in diameter, opens posterior to the cirrus pouch in the genital atrium. Receptaculum seminis measures 0.024–0.036x0.006–0.012 (0.030x0.009), located at the proximal end of the vagina.

Genital atrium measures 0.006–0.012 (0.009) deep and 0.024–0.036 (0.030) wide. Genital pores alternating regularly located in the anterior half of the proglottids margin.

Uterus persistant, sac like measures 0.060–0.084x0.108–0.132 (0.072x0.120), within the limits of ventral longitudinal excretory canals.Uterus first appears as two sacs and later on into single one eggs. Eggs measures 0.0128–0.0144x0.0144–0.0160 (0.0135x0.0152). Onchospheres measure 0.0064–0.0096x0.0064–0.0096 (0.0080x0.0080).

Ventral longitudinal excretory canals measure 0.006–0.012 (0.009) in diameter.

## Discussion

The present form comes closer to Amoebotaenia lumbrici (Villot, 1883) Joyex et Bear, 1939; Amoebotaenia madrasiensisDixit and Capoor, 1981 and Amoebotaenia yamasigi Yamaguti, 1956.

The present form differs from Amoebotaenia lumbrici (Villot, 1883) Joyex etBear, 1939 in having longer worms, narrower rostellum, larger number of smaller rostellar hooks, smaller testes. From Amoebotaenia madrasiensisDixit and Capoor, 1981 the present form differs in having longer worms, narrower scolex, narrower rostellum, larger number of smaller

testes, wider cirrus pouch and smaller eggs. From Amoebotaenia yamasigi Yamaguti, 1956 the present form differs in having larger vorms, smaller rostellar hooks, smaller testes and smaller eggs.

In the light of above discussion it is proposed to accommodate the present form as a new species, Amoebotaenia gharmauensis sp.

Host : Rodicepe rufescellis(Pallas)

Habitat : Intestine

Locality : Gharmau, Jhansi (U.P.)

Holotype : Department of Zoology
Bipin Bihari (P.G.) College,
Jhansi.

Table 8

Comparison of the characters of the species closer to Amoebotaenia gharmauensisn. sp

| Species | Size | Scolex Width | Rostellum Width | Rostellar hooks No | Rostellar hooks Length | Testes No | Cirrus pouch Size | Cirrus pouch Size | Cirrus pouch Extension | Egg |
|---|---|---|---|---|---|---|---|---|---|---|
| A.lumbrici (Villot,1883) Joyeux et Bear, 1939 | 1.0 | 0.21-0.25 | 0.07-0.1 | 16 | 0.081-0.092 | 7-10 | 0.025-0.003 | 0.062-0.067 | Past | - |
| A.madrasiensis Dixit & Capoor,1981 | 1.2-2.4 | 0.199-0.289 | 0.07-0.125 | 14-16 | 0.024-0.039 | 9-12 | 0.014-0.048x 0.013-0.051 | 0.05-0.097x 0.018-0.034 | - | 0.027-0.035x 0.026-0.034 |
| A.yamasigi Yamaguti, 1956 | 1.0-1.2 | 0.15-0.2 | - | 15-18 | 0.075-0.084 | 6-10 | 0.045 | - | beyond | 0.03x 0.091 |
| A.gharmauensisn.sp. | 3.1-4.0 | 0.126-0.210 | 0.024-0.042 | 16-20 | 0.0096-0.0144 | 5-9 | 0.012-0.024 | 0.080-0.138x 0.036-0.054 | Well past | 0.0128-0.0144x 0.0144-0.0160 |

Amoebotaenia gharmaensisn. sp.

Fig 1 Scolex (10x10)

Fig 2 Rostellar hooks (10x45)

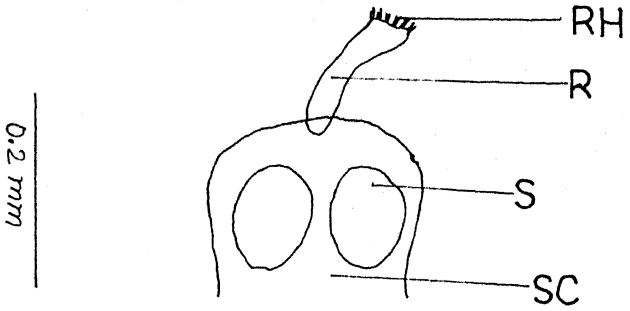
Fig 3 Mature proglottid (10x10)

Fig 4 Gravid proglottid (10x10)

Fig 5 Cirrus pouch with cirrus spines (10x10)

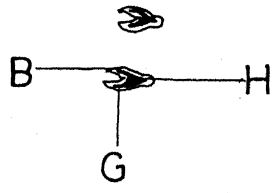
Fig 6 Egg (10x45)

Abbreviations :- B, blade; CP, cirrus pouch; CS, cirrus spines; E, egg; EVS, external seminal vesicle; G, guard; GA, genital atrium; H, handle; IVS, internal seminal vesicle; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook; RS, receptaculum seminis; S, sucker; SC, scolex; T, testes; U, uterus; V, vagina; VG, vitelline gland; VLEC, ventral longitudinal excretory canal.



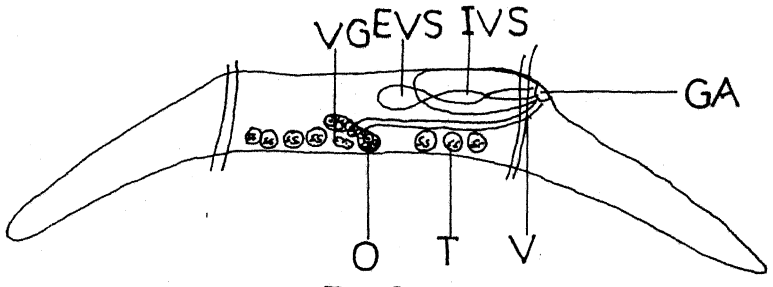

0.2 mm

Fig 1



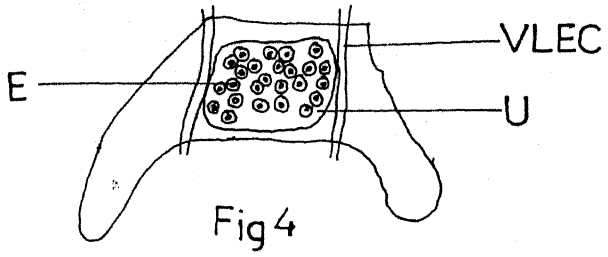

0.05 mm

Fig 2



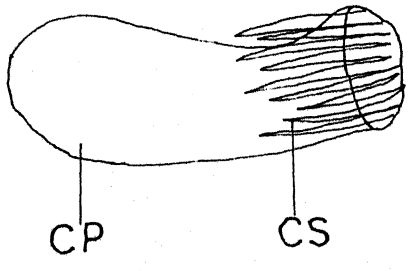

0.2 mm

Fig 3



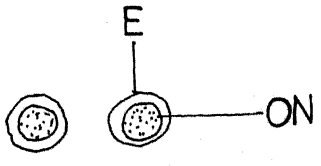

0.2 mm

Fig 4




0.05 mm

Fig 5




0.05 mm

Fig 6

*Amoebotaenia gharmauensis* n.sp.

Family - Dilepididae Railliet etHenry, 1909

Subfamily - Dilepidinae Fuhrmann, 1907

Genus - AmoebotaeniaCohn, 1900

Species - Amoebotaeniavimleshii n.g., n.sp.

(Figs. 1-5. PP 108 )

Out of four tufted pochard, Aythya fuligula (Linn.) examined at Baruwasagar, Jhansi (U.P.). one was found infected with three specimens of the present form in the duodenum of the host. The morphological studies of the cestodes revealed them to represent Amoebotaenia Cohn, 1900 of the subfamily Dilepidinae Fuhrmann, 1907; family Dilepididae Railliet etHenry, 1909.

Cestodes are small in size 3.5-5 in length and 0.870 in maximum width as seen in the matur proglottids. Proglottids extremely craspedote and broader than long.

Scolex measures 0.456-0.516x0.648-0.720 (0.486x0.684), well demarcated from the neck. Suckers unarmed, oval to round measure 0.168-0.240x0.108-0.150 (0.204x0.129). Rostellum measures 0.289-0.301x0.448-0.456 (0.295x0.452). Rostellum bears 24-30 (27) rostellar hooks in number arranged in single row. Rostellar hook measure 0.0832-0.1008 (0.0920) in length. Each rostellar hooks contain a handle, 0.0496-0.0608 (0.0552); a guard, 0.0240-0.0282 (0.0261) and a blade, 0.0336-0.0401 (0.0368) in length.

Neck measures 0.045–0.072x0.126–0.156 (0.060x0.141). Immature proglottids measure 0.024–0.054x0.090–0.330 (0.039x0.210): mature proglottids measure 0.054––0.090x0.396–0.870 (0.072x0.633) and gravid proglottids measure 0.168–0.210x0.390–0.690 (0.189–0.540).

Testes 7–13 in number. oval to spherical measures 0.012–0.036x0.018–0.042 (0.024x0.030), posterior to ovary. Cirrus pouch measures 0.048–0.090x0.018–0.042 (0.069x0.030), crosses the poral ventral longitudinal excretory canal. Internal and external seminal vesicles absent.

Female genitalia median. Ovary bilobed measures 0.006–0.042x0.054–0.096 (0.024x0.075). Vitelline gland compact, postovarian measures 0.006–0.012x0.012–0.030 (0.009x0.024). Vagina opens to cirrus pouchin genital atrium measures 0.004–0.012 (0.008) in diameter. Receptaculum seminis 0.018–0.036x0.006–0.018 (0.027x0.012), located at the proximal end of the vagina.

Genital atrium measures 0.006–0.018 (0.012) deep and 0.006–0.020 (0.014) wide. Genital openings alternate regularly. located at the anterior half of the proglottid margin.

Uterus sac like within the limits of ventral longitudinal excretory canals measures 0.132–

0.180x0.330-0.456 (0.156x0.393). Eggs measures 0.0112-0.0193x0.0128-0.0193 (0.0152x0.0160). Onchospheres measure 0.0064-0.0112x0.0064-0.0112 (0.0088x0.0088).

Ventral longitudinal excretory canals measure 0.006-0.018 (0.012) in diameter.

## Discussion

The present form comes closer to Amoebotaenia capoori Srivastava and Srivastav; 1987 Amoebotaenia fuhrmanni Tseng, 1932; Amoebotaenia indica Srivastava et al. 1983; Amoebotaenia pekinensisTseng, 1932 and Amoebotaenia vanellifuhrmann, 1907.

The present form differs from A. capoori Srivastava and Srivastav, 1987 in having longer worms, wider scolex, greater number of larger rostellar hooks, smaller number of testes, smaller cirrus pouch and smaller eggs. From A. fuhrmanniTseng, 1932 the present form differs in having narrower worms, wider rostellum, greater number of larger rostellar hooks, greater number of larger testes, larger cirrus pouch do not extend uoto ventral longitudinal excretory canal of aporal side. From A. indicaSrivastava et al 1983 the present form differs in having wider worms, greater number of larger rostellar hooks, lesser number of smaller testes, smaller cirrus pouch which crosses the ventral longitudinal excretory canal and smaller eggs. From A pekinensisTseng, 1932 the present form differs in having larger worms, wider scolex, wider rostellum,

greater number of larger rostellar hooks, lesser number of smaller testes, smaller cirrus pouch and smaller eggs. From A. vanelliFuhrmann, 1907 the present form differs in having longer worms, wider scolex, wider rostellum, greater number of larger rostellar hooks, lesser number of smaller testes and smaller cirrus pouch.

In the light of above discussion it is proposed to accommodate the present form as a new species, Amoebotaenia vimleshiin. sp.

Host : Aythya fuligula(Linn.)

Habitat : Duodenum

Locality : Baruwasagar, Jhansi.

Holotype : Department of Zoology
Bipin Bihari (P.G.) College, Jhansi

Table 9

Comparison of the characters of the species closer to Amoebotaenia vimleshiin. sp.

| | Size | Scolex width | Rostellum width | Rostellar hooks No | Rostellar hooks length | Testes No | Cirrus Size | Pouch extension | Egg |
|---|---|---|---|---|---|---|---|---|---|
| A capoori Srivastava and Srivastav, 1987 | 1.8-2.2x 1.273 | 0.15-0.248 | 0.06-0.101 | 10-12 | 0.021-0.048 | 11-17 | 0.02-0.054x 0.022-0.052 | 0.079-0.117x 0.029-0.058 | Past | 0.012-0.035x 0.015-0.032 |
| A. fuhrmanni Tseng, 1932 | 4.5-4.77x 0.23-0.51 | 0.22 | 0.68 | 10 | 0.07 | 12-16 | 0.012-0.02 | 0.044-0.052 | Displaced to aporal side | 0.018 |
| A. indica Srivastava etal, 1983 | 2.0-4.0x 0.48-0.58 | - | - | 12 | 0.03-0.033 | 12-16 | 0.04-0.05 | 0.01-0.12x 0.01-0.072 | Not reaching up to poral VLEC | 0.028-0.029x 0.025-0.028 |
| A.pekinensis Tseng, 1932 | 3.0x 0.374 | 0.285x 0.467 | 0.079 | 16 | 0.054-0.061 | 12-20 | 0.06-0.08 | 0.1-0.18 | Past | 0.048 |
| A.varilli Furhmann, 1907 | 7.5x 0.085 | 0.16 | 0.091 | 16 | 0.046-0.050 | 12-18 | 0.048-0.056 | 0.1-0.30 | - | - |
| A.vimleshii n. sp. | 3.5-5.0x 0.870 | 0.648-0.720 | 0.448-0.456 | 24-30 | 0.0832-0.1008 | 7-13 | 0.012-0.036x 0.019x 0.042 | 0.048-0.090x 0.018-0.042 | Past | 0.0112-0.0193x 0.0128-0.0193 |

Table 10

Comparison of the characters of Anoebotaenia gharmauensis n. sp. and Anoebotaenia vimleshii n. sp.

| | A. gharmauensis n. sp. | A. vimleshii n. sp. |
|---|---|---|
| Size | 3.108–4.006×0.840 | 3.5–5×0.870 |
| Scolex | 0.456–0.516×0.648–0.720 | 0.169–0.150×0.126–0.210 |
| Rostellum | 0.084–0.126×0.024×0.042 | 0.289–0.301×0.448–0.456 |
| Rostellar hooks No | 16–20 | 24–30 |
| Length | 0.0096–0.0144 | 0.0852–0.1068 |
| Testes No | 5–7 | 7–13 |
| Size | 0.012–0.024×0.012–0.024 | 0.012–0.036×0.018–0.042 |
| Cirrus pouch Size | 0.090–0.138×0.036–0.054 | 0.048–0.090×0.018–0.042 |
| extension | Cross the poral VLSD | reaches upto the middle of the proglottids |
| Egg | 0.0129–0.0144×0.0144–0.0160 | 0.0112–0.0193×0.0128–0.0193 |

Amoebotaenia vimleenlin. sp.

Fig 1 Scolex with neck (Scale)

Fig 2 Rostellar hook (Scale)

Fig 3 Mature proglottis (Scale)

Fig 4 Gravid proglottis (Scale)

Fig 5 Egg (Scale)

Abbreviations :- B, blade; CP cirrus pouch; E, egg; G, guard; GA, genital atrium; H, handle; N, neck; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook; RS, receptaculum seminis; S, sucker; SC, scolex; T, testes; U, uterus; V, vagina; VD, vas deferens; VG, vitelline gland; VLEC, ventral longitudinal excretory canal.

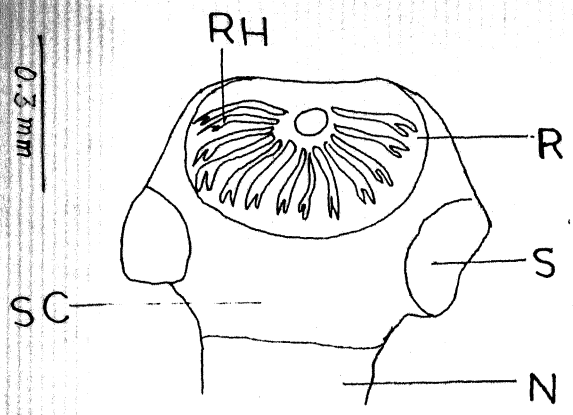



Fig 1

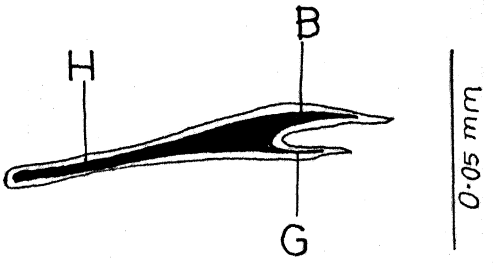



Fig 2

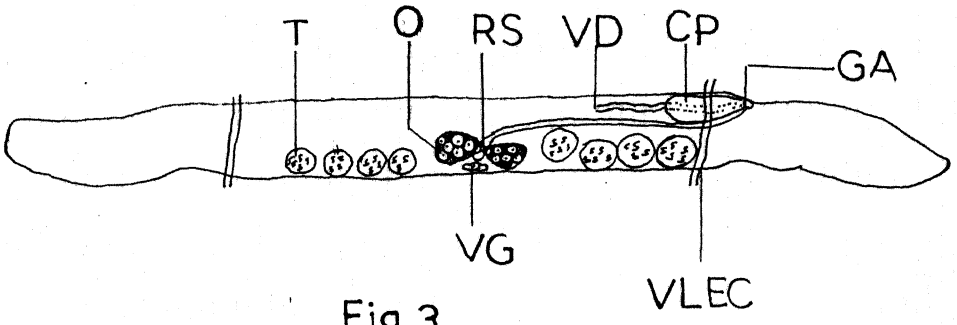



Fig 3

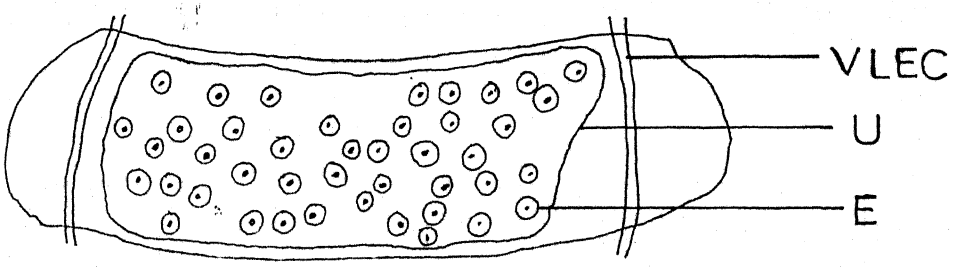



Fig 4

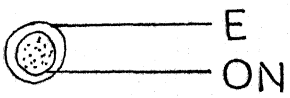



Fig 5

Family – Dilepididae Railliet etHenry, 1909

Subfamily – Dilepidinae Fuhrmann, 1907

Genus – Laterotestinan.g.

Species – Laterotestina newarensisn.sp.

(Figs. 1-5, PP 117 )

Out of four little grebs, Podiceps ruficollis (Pallas) examined at Niwari, District Tikamgarh (M.P.), one was found infected with single specimen of the present from in the intestine of the host. The morphological studies of the cestode revealed them to belong to the genus Laterotestinan.g. of the family Dilepididae Railliet et Henry, 1909; subfamily Dilepidinae Fuhrmann, 1907.

**Amended diagnosis of the genus Laterotestina family Dilepididae**

Small size worm, with a single crown of large rostellar hooks, proglottids extremely craspedote and broader than long, testes numerous in two lateral fields to female glands. Cirrus pouch very short, ovary bilobed and each lobe further lobulated. Internal and external seminal vesicles absent, genital openings alternate regularly, uterus sac like. Parasite of aquatic birds.

Laterotestinan.g.

**Generic diagnosis :-**

Small size worms with few segments, armed rostellum present with single circle of rostellar hooks. Suckers unarmed, neck absent, proglottids extremely craspedote, broader than long. Testes in two lateral fields to female genitalia, cirrus pouch not reaching upto the poral ventral longitudinal excretory canal. Internal and external seminal vesicles absent, ovary bilobed each lobe further lobulated. Vitelline gland postovarian, genital atrium very small, genital opening alternate regularly, Uterus sac like with many out growths extending beyond the limits of Ventral longitudinal excretory canals.

Laterotestina newarensisn.g., n.sp.

Cestodes measure 21 cm in length and 3.720 in maximum width as seen in the mature proglottids. Proglottids extremely craspedote, broader than long.

Scolex measures 0.408x0.748. Suckers four, unarmed, oval to round measure 0.084-0.120x0.072-0.144 (0.102x0.108). Rostellum measures 0.410x0.504. Rostellum provided with 16-20 rostellar hooks, arranged in a single row. Rostellar hooks measure 0.108-0.138 (0.123) in length. Each rostellar hook contains a handle, 0.066-0.078 (0.072); a blade, 0.042-0.054

(0.048) and a guard 0.042–0.060 (0.053) in length.

Neck absent. Immature proglottids measure 0.144–0.192x0.576–2.880 (0.168x1.728); mature proglottids measure 0.144–0.264x2.640–3.720 (0.204x3.180) and gravid proglottids measure 0.528–0.960x2.520–3.001 (0.744x2.760).

Testes 40–65 in number, oval to round, arranged in two groups on each side of female genitalia. Each poral and aporal groups contains 19–30 and 21–34 testes respectively. Testes measures 0.012–0.048x0.012–0.048 (0.030x0.030). Cirrus pouch oval measures 0.132–0.192x0.036–0.072 (0.162x0.059), never crosses the ventral longitudinal excretory canals. Internal and external seminal vesicles absent.

Female genitalia median, Ovary lobulated measures 0.024–0.108x0.168–0.312 (0.066x0.240). Vitelline gland postovarian measures 0.012–0.036x0.041–0.120 (0.024x0.096). Vagina posterior to cirrus pouch measure 0.012–0.030 (0.021) in diameter, open into the genital atrium. Receptaculum seminis measures 0.084–0.108x0.012–0.030 (0.096x0.021).

Genital atrium measures 0.024–0.072x0.060–0.084 (0.048x0.072) wide and deep respectively. Genital pores alternate regularly, located in the anterior half of the proglottid margin.

Uterus sac like with numerous out growths crosses the ventral longitudinal excretory canals. Uterus measures 0.336-0.624x1.800-2.424 (0.480x2.112). Eggs measure 0.0145-0.0203x0.0145-0.0174 (0.0174x0.0159). Onchospheres measure 0.0058-0.0116x0.0058-0.0116 (0.0087x0.0087).

Ventral longitudinal excretory canals measure 0.012-0.030 (0.021) in diameter.

## Discussion

On the basis of disposition of testes the present form comes closer to Amoebotaenia Cohn, 1900 and BakererpesRausch, 1947.

The present form differs from the genus Amoebotaenia Cohn, 1900 in having the extremely craspedote proglottids, genital atrium without bristles, disposition of testes, smaller cirrus pouch which never crosses the ventral longitudinal excretory canal, different shape of ovary and uterus with numerous outgrowths. From BakererpesRausch, 1947 in having smaller genital atrium without spines different disposition of testes, smaller cirrus pouch which never crosses the ventral longtudinal excretory canal different shape and disposition of ovary and uterus with numerous out growths.

In the light of above discussion it is proposed to accommodate the present form as a new genus, Laterotestina and a new species, Laterotestina newarensisn.g., n.sp.

Host : Podiceps ruficollis(Pallas)

Habitat : Intestine

Locality : Niwari, Distt. Tikamgarh (M.P.

Holotype : Department of Zoology
Bipin Bihari (P.G.) College,
Jhansi

Table 11

Comparison of the characters of the various genera closer to new genus Laterotestina n.g.

| | Proglottids | Genital atrium | Testes | Cirrus pouch | Ovary | Uterus |
|---|---|---|---|---|---|---|
| Amoebotaenia Cohn, 1900 | Craspedote or not | Atrium may have long bristles | Testes few (6 to 20) in single transverse row posterior to ovary | Cirrus pouch entire, vas deferens crosses the VLEC | Ovary transversely elongated | An irregular sac |
| Bakererpes Rausch, 1947 | Wider than long, strongly convex on poral side | Atrium large with muscular walls lined with small spines | Testes posterior to ovary | Cirrus pouch very large at least reaching median line of segment. | Ovary median, bilobed | A large sac |
| Laterotestina n.g. | extremely craspedote | Atrium small and normal | Testes numerous arranged in two lateral fields | Cirrus pouch very small not reaches upto VLEC | Ovary bilobed each lobed further lobulated | Sac like with numerous out growths |

Table 11

Comparison of the characters of the various genera closer to new genus Laterotestinan.g.

| | Proglottids | Genital atrium | Testes | Cirrus pouch | Ovary | Uterus |
|---|---|---|---|---|---|---|
| Ancabotaenia Cohn, 1900 | Craspedote or not | Atrium may have long bristles | Testes few (6 to 20) in single transverse row poster-ior to ovary | Cirrus pouch extra-vascular crosses the VLEC | Ovary trans-versely elonga-ted | An irregu-lar sac |
| Bakerempes Rausch, 1947 | Wider than long, strong-ly convex on poral side | Atrium large with muscular walls lined with small spines | Testes poster-ior to ovary | Cirrus pouch very large at least re aching median line of segment. | Ovary median, bilobed | A large sac |
| Laterote stina n.g. | extremely craspedote | Atrium small and normal | Testes numerous arranged in two lateral fields | Cirrus pouch very small not reaches upto VLEC | Ovary bilobed each lobed further lobulated | Sac like with num erous out growths |

## KEY TO THE GENERA IN DILEPIDINAE

1a. Two sets of reproductive organs per segment ....Mirandula

1b. One set of reproductive organs per segment ....2

2a. Genital pores unilateral .... 3

2b. Genital pores alternating .... 22

22a. Rostellum lacking .... 23

22b. Rostellum present armed or not .... 25

25a. Rostellum unarmed .... 26

25b. Rostellum armed .... 28

28a. Genital pores alternating regularly .... 29

28b. Genital pores alternating irregularly .... 37

29a. One circle of rostellar hooks .... 30

29b. Two circles of rostellar hooks .... 32

30a. Rostellum elongate, capable of being coiled within rostellar sac

30b. Rostellum not capable of being coiled within rostellar sac ..... 31

31a. Genital duct passing between osmoregulatory canals. Testes in postovarian cluster ....Bakererpes

31b. Genital ducts dorsal to osmoregulatory canals.Testes in single, posterior row ....Amoebotaenia

31c. Genital ducts crosses the osmoregulatory canals Testes in two lateral fields ....Laterotestinan.g.

**Laterotestina newarensis** n.g., n.sp

Fig 1 Scolex (5x10)

Fig 2 Rostellar hook (10x10)

Fig 3 Mature proglottid (5x10)

Fig 4 Gravid proglottid (5x10)

Fig 5 Egg (5x45)

Abbreviations :- B, blade; CP, cirrus pouch; E, egg; G, guard; GA, genital atrium; H, handle; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook; RS, receptaculum seminis; S, sucker; SC, scolex; T, testes; U, uterus; V, vagina; VG, vitelline gland; VLEC, ventral longitudinal excretory canal.

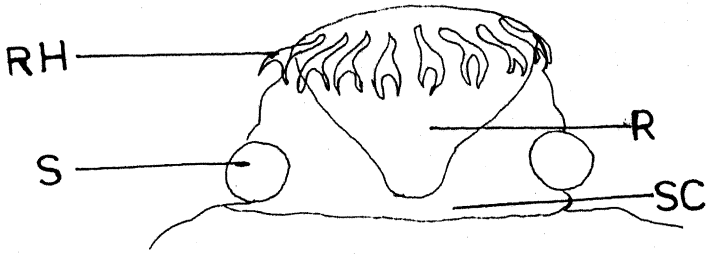



Fig 1

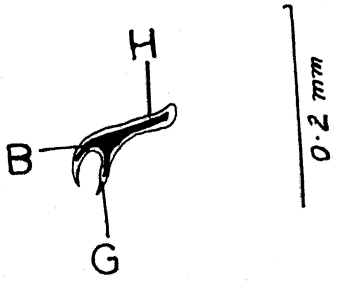



Fig 2

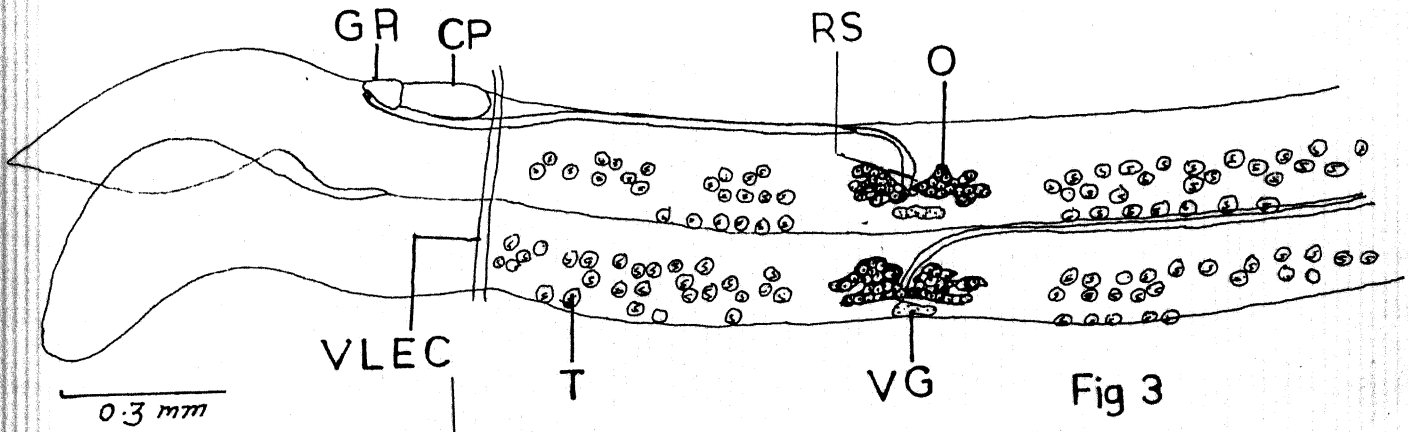



Fig 3

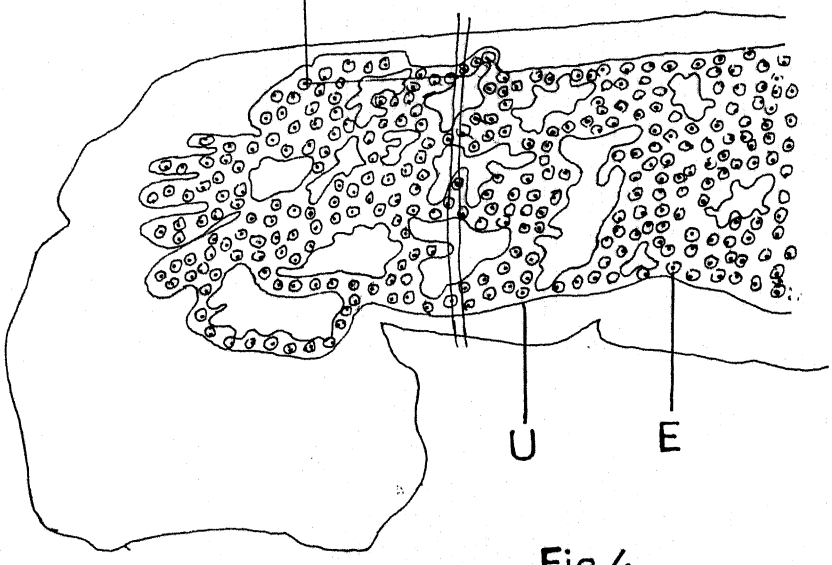



Fig 4

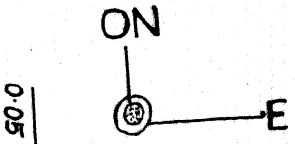



Fig 5

Family : Dilepididae Railliet et Henry, 1909

SubFamily: Dilepidinae Fuhrmann, 1907

Genus : Vireshwarin.g.

Species : Vireshwari baruasagarensisn.g, n.sp.

(Figs :1-5 ;pp- 126 )

Out of seven little grebes, Podiceps ruficollis (pallas), examined at Baruagar, District. Jhansi (U.P.) three were found infected with seventeen cestodes. The cestodes were present in the intentines of the host. The morphological studies of the cestode parasites revealed them to belong to the new genus Vireshwari n.g. of the Subfamily Dilepidinae Fuhrmann, 1907; family Dilepididae Railliet et Henry, 1909

Amended diagnosis of the Subfamily. Dilepidinae

Proglottids extremely craspedote, smaller genital atrium, cirrus unarmed. Internal and external seminal vesicles present. Testes preovarian in two dorsolateral fields.

Vireshwari n.g.

Generic diagnosis : Small sized worms proglottid extremely craspedote, preovarian testes in two dorsolateral fields, larger cirrus puch in the anterior half of the proglottid. Internal and external seminal vesicles present, genital pores altarnate

regularly. Ovary bilobed slightly poral. Vitelline gland postovarian. Uterus with regular sac. Parasites of aquatic birds.

Vireshwari baruasagarensisn.g, n.sp.

Cestodes measure 4-7 × in length and 0.528 in maximum width as seen in the gravid proglottids. proglottids extremely craspedote, broader than long. Scolex measures 0.078-0.096x0.144-0.162(0.087x0.153). well demarcated from the neck.Suckers unarmed, oval to round measure 0.054-0.072x0.042-0.054 (0.063x0.048). Rostellum protruded, cylindrical measures 0.078-0.090x0.012-0.024 (0.084x0.018). Rostellar hooks 10-12 in number, arrenged in a single row. Rostellar hooks measure 0.0128-0.0160 (0.0144) in length. Each rostellar hooks bear a short handle 0.0032-0.0040 (0.0036); guard 0.0096-0.0112 (0.0104) and blade, 0.0104-0.0112 (0.0108) in length. Neck measure 0.018-0.030x0.054-0.084(0.024x0.070). Immature proglottids measure 0.006-0.018x0.084-0.168(0.012x0.112); mature proglottids measure 0.078-0.096x0.186-0.301 (0.087x0.243) and gravid proglottids measure 0.168-0.216x0.258-0.528 (0.192x0.393).

Testes 15-22 in number, oval to round, preovarian in two dorsolateral fields. Testes measures 0.004-

0.012x0.004–0.009 (0.008x0.0070).Cirrus pouch measures 0.042–0.084x0.024–0.036(0.063x0.030), crosses the poral ventral longitudinal excretory canal. Internal seminal vesicle measures0.018–0.030x0.006–0.015(0.024x0.012); external seminal vesicle mesures 0.030–0.060x0.006–0.030 (0.045 x 0.018).

Female genitalia median. Ovary slightly bilobed measure 0.006–0.012x0.024–0.042 (0.009x0.033). Vitelline gland compact, postovarian measures 0.006–0.009x 0.012 –0.024 ( 0.008x0.018). Vagina measures 0.006–0.008 (0.007) in diameter, openspposterior to cirrus pouch in the genital atrium. Receptaculum seminis measure 0.012–0.024x0.006–0.012 (0.018x0.009).located at the proximal xx end of the vagina .

Genital atrium measure 0.006–0.018 (0.012) in depth and 0.011–0.023 (0.018) in width . Genital pores alternate regularly located in the anterior half of the proglottids margin.

Uterus persistant, Sac like measures 0.126–0.168x0.186–0.222 (0.147x0.204), with in the limits of ventral longitudinal excretory canals. Eggs measure 0.0096–0.0128x0.0070–0.0128 (0.012x0.009).Onchospheres measure 0.0048–0.0080x0.0048–0.0080 (0.0064x0.0064).

Ventral longitudinal excretory canals measure 0.006–0.012 (0.009) in diameter.

## Discussion

According to Schmidt, 1986 the cestodes belong to the family Dilepididae Railliet et Henry, 1909 On the basis of genital ducts, seminal vesicles, disposition of testes and arrangement of uterine sacs. It comes closer to BakererpesRausch, 1947 and AmoebotaeniaCohn, 1900.

The present form differs from the Bakererpes Rausch, 1947 in having a longer rostellum, genital ducts not passing between osmoregulatory canals, preovarian testes in two dorsolateral field, Smaller genital atrium, unarmed cirrus and presence of internal and extrenal seminal vesicles. From Amoebotaenia Cohn, 1900 it differs in having preovarian testes in two dorsolateral fields, larger cirrus pouch, bilobed ovary and uterus with regular sac.

In the light of the above discussion the present form is accommodated as a new genus and a new species, Vireshwari baruasagarensisn.g.,n.sp.

The genus is named after prof. (Dr.) V.N.Capoor an eminent Indian cestodologist.

Host -Podiceps ruficollis(pallas)

Habitat - Intestine

Locality - Baruasagar, Jhansi. (U.P.)

Holotype - Department of Zoology,
Bipin Bihari (P.G.) College,
Jhansi.

Table - 12

Comparison of the charaters of the Various genera closer to new genus Vireshwari n.g.

| | Proglottids | Testes | Cirrus pouch | Seminal vesicles | Ovary | Uterus |
|---|---|---|---|---|---|---|
| Bakererpes Rausch, 1947 | Trapezoidal, wider than long, strongly convex on pore side | Testes numerous posterior to female gland. | Armed cirrus larger cirrus pouch. | absent | bilobed | uterus a large sac |
| Amoebo-taenia cohn, 1900 | Proglottids craspedote or not | Testes few posterior to ovary in single transverse row | Cirrus pouch small | - | Transver-sely elongated | Uterus an irregular sac |
| Vireshwari n.g. | Proglottids extremely craspedote | Testes few preovarian in two dorsolateral fields | Cirrus pouch reaches upto middle of the segment. | Internal and external seminal vesicle present. | Ovary bilobed small | Uterus as regular sac. |

## Key to the genera of the subfamily Dilepidinae

| | | |
|---|---|---|
| 1a. | Two sets of reproductive organs per segment. | ...Mirandula |
| 1b. | One set of reproductive organs per segment. | ... 2 |
| 2a. | Genital pores unilateral | ... 3 |
| 2b. | Genital pores alternating | ... 22 |
| 22a. | Rostellum lacking | ... 23 |
| 22b. | Rostellum present, armed or not | ... 25 |
| 25a. | Rostellum unarmed | ... 26 |
| 25b. | Rostellum armed. | ... 28 |
| 28a. | Genital pores alternating regularly | ... 29 |
| 28b. | Genital pores alternating irregularly | ... 37 |
| 29a. | One circle of rostellar hooks | ... 30 |
| 29b. | Two circles of rostellar hooks | ... 32 |
| 30a. | Rostellum elongate, capable of being coiled with in rostellar sac | ... Taeniarhynchaena |
| 30b. | Rostellum not capable being coiled within rostellar sac. | ... 31 |
| 31a. | Genital ducts passing between osmoregulatory canals. Testes in a postovarian cluster. | ... Bakererpes |

31b. Genital ducts dorsal to osmore gulatory canals. Testes preovarian in two dorsolateral fields. ... Vireshwari n.g.

31c. Genital ducts dorsal to osmoregulatory canals (between them in A setosa, Burt 1940). Testes in single, posterior row ... Amoebotaenia

Vireshwari baruasagarensisn.g.,n.sp.

Fig 1 Scolex (10 x 10)

Fig 2 Rostellar hook ( 10 x 450

Fig 3 Mature proglottid (10 x 10)

Fig 4 Gravid proglottid ( 10 x 10)

Fig 5 Egg ( 10 x 45)

Abbreviations :- B,blade; CP, cirrus pouch; E, egg; EVS, external seminal vesicle; G, guard; GP, gential pore; H, handle; IVS, internal seminal vesicle; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook; RS, receptanulum seminis; S, sucker; SC, scolex; T, testes; U, uterus; V, vagina; VG, vitelline gland; VLEC, ventral longitudinal excretary canal.

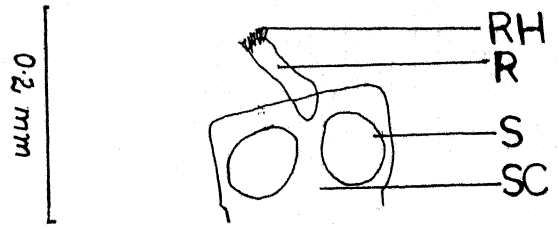



Fig 1

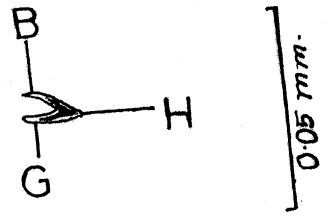



Fig 2

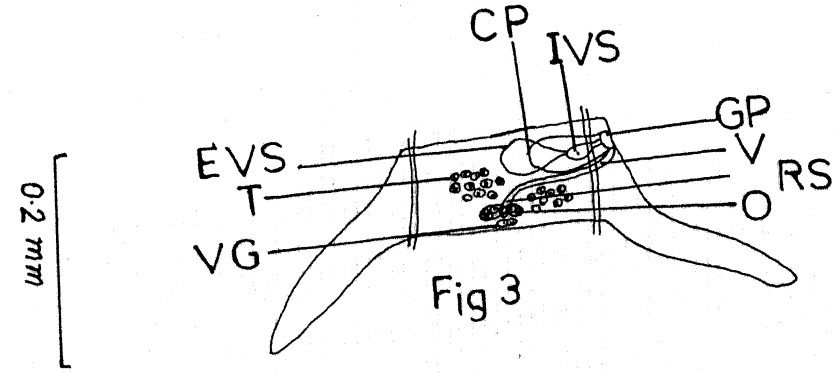



Fig 3

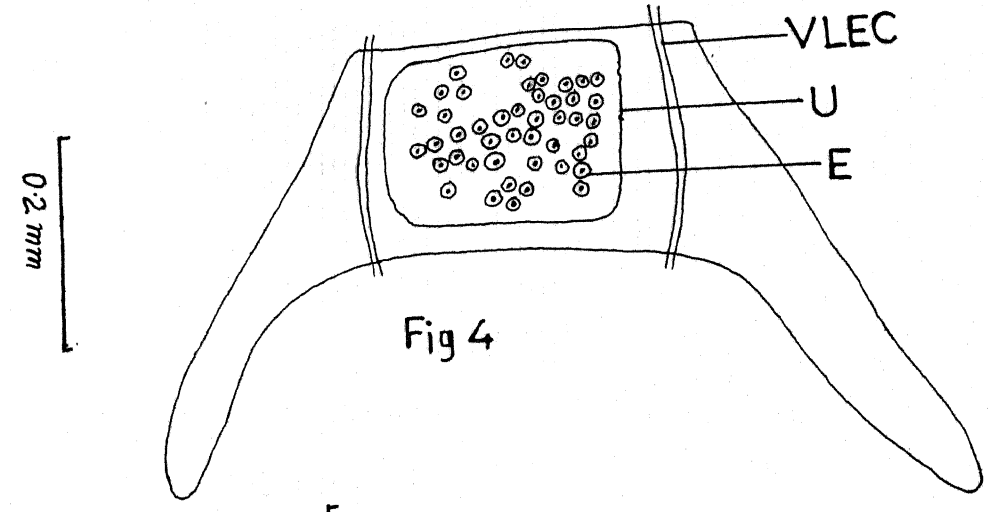



Fig 4

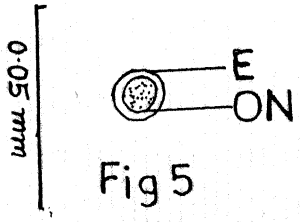



Fig 5

Family : Dilepididae Railliet et Henry, 1909.

Subfamily : Dilepidinae Fuhrmann, 1907.

Genus : Transvertian.g.

Species : Transvertia kareyraensisn.g., n.sp.

(Figs. 1-5; pp -134 )

Out of five large grey babbler, Turdoides malcolmi (sykes) exmined at kareyra District Shivpuri (M.P.) , two were found infected with seven cestodes. The cestodes were obtained in the intestine of the host. The morphological studies of the cestodes revealed them to belog to the new genus Transvertia n.g. of the subfamily Dilepidinae Fuhrmann, 1907; family Dilepididae Railliet et Henry, 1909.

Amended diagnosis of the subfamily Dilepidinae Dilepididae: Testes numerous occupy the whole proglottid. Ovary transverse tube like in poral side. Genital pores irregularly alternate and uterus persistant.

Transvertia n.g.

Generic diagnosis : Medium sized worms, scolex with arned rostellum one set of genitalia per proglottid. Testes numerous occupy the whole proglottid, extend beyond the limits of ventral longitudinal excretory canals. Cirrus pouch small. Ovary on poral side, transverse tube like, Uterus persistant. Parasites of birds.

Transvertia kareyraensis n.g., n.sp.

Cestodes measure 30-32 cm in length and 0.901 in maximum breadth seen in mature proglottids. Strobila consists of a number of proglottids; Proglottids are broader than long and craspedote.

Scolex measures 0.504 - 0.696 x 0.324 - 0.624 (0.600x0.474). Suckers four, oval to round measure 0.156-0.252x0.156-0.264 (0.204x0.210). Rostellum measures 0.084-0.144x0.084 - 0.120 (0.114x0.102), provided with 6 - 8 rostellar hooks arranged in single row. Rostellar hooks measure 0.0624-0.0688 (0.0656) in length. Rostellar hook contains a handle, 0.0352-0.0384 (0.0368);a blade 0.0282-0.0304 (0.0293) and a guard 0.0064 - 0.0080 (0.0072)in length.

Neck measures 0.3091 -0.481 x 0. 312 - 0.378 (0.435 x 0.354). Immature proglottids measure 0.018 - 0.054 x 0.532 -0.666 (0.036 x 0.599); mature proglottids measure 0.108 - 0.162 x 0.768 -0.900 (0.1'35 x 0.834) and gravid proglottids measure 0.168 - 0.270 x 0.432 - 0.714 (0.219 x 0.573).

Testes oval to round, 25-48 in number measures 0.012-0.030 x 0.012-0.030(0.021x0.021), distributed in whole proglottids, extend beyond the limits of ventral longitudinal excretory canals. Cirrus pouch small measures 0.054-0.090x0.024-0.036 (0.072x0.030),

neverreaches upto poral ventral longitudinal excretory canal.Cirrus unarmed.Internal seminal and external seminal vesicles absent.

Female genitalia located on the poral side. Ovary measures 0.024-0.036x0.072-0.102(0.030x0.087) transverse tubelike nearly touches the margin anteriorly. Vitelline gland small compact measures 0.012-0.024x0.024-0.030(0.018x0.027).Receptaculum seminis measures 0.036-0.060x0.006-0.024(0.048 x 0.015). Vagina measures 0.006-0.012(0.009)in diameter, opens posterior to cirrus pouch .

Genital atrium measures 0.018 -0.036 (0.027)wide and 0.006-0.027(0.018)deep. Genital pores irregularly alternate and located in the anterior half of the proglottid margin.

Uterus sac like, persistant measures 0.072-0.138x0.150-0.348(0.105x0.249). Eggs measure 0.0096-0.0160(0.0128)in diameter. Onchospheres measure 0.0048-0.0080(0.0064) in diameter.

Ventral longitudinal excretory canals measure 0.006-0.018(0.012) in diameter.

## Discussion

According to Schmidt, 1986 the cestodes belong to the family Dilepididae Railliet et Henry, 1909 On the basis of arrangement of testes, extension of cirrus

pouch and location of ovary. The present form comes closer to KrimiBurt, 1944; Laterorchites Fuhrmann, 1932; Polycercus Villot, 1883 and Tubanguiella Yamaguti,1959.

The present form differs from the genus Krimi Burt, 1944 in having disposition of testes, extension of cirrus pouch, absence of vas deferense, disposition and shape of ovary. From LaterorchitesFuhrmann, 1932 it differs in having different disposition of testes, extension of cirrus pouch, shape and position of ovary. From Polycercus Villot, 1883 it differs in having disposition of testes, an unarmed cirrus, different extension of cirrus pouch, absence of vas deferens, shape and disposition of ovary. From Tubanguiella Yamaguti, 1959 it differs having disposition of testes, an unarmed cirrus, different extension of cirrus pouch, absence of vas deferens, shape and position of ovary.

In the light of the above discussion it is proposed to accommodate the present form as a new genus Transvertia n.g. and a new species, Transvertia kareyraensisn.g.,n.sp.

Host : Turdoides malcolmi (Sykes)

Habitat : Intestine

Locality : Kareyra, Shivpuri . (M .P .)

Holotype : Department of Zoology ,
Bipin Bihari (P.G) College, Jhansi.

Table - 13
Comparison of the characters of Transvertia n.g. with other genera

| | Testes | Cirrus armed/ unarmed | Cirrus pouch Extension | Vas deferens | Ovary | uterus |
|---|---|---|---|---|---|---|
| Krimi Burt, 1944 | Testes numerous, posterior | - | cirrus pouch may cross osmoregulatory canals | present | compact, anterior | Reticular |
| Laterorchitas Fuhrmann, 1932 | Testes in two lateral fields. | armed | cross the ventral longitudinal excretory canal. | absent | Compact, posterior | Sac like |
| Polycercus Villot, 1883 | Testes posterior to ovary | armed | cirrous pouch crosses osmoregulatory canal | present | Ovary median lobated, prequatorial | Sac like |
| Tubanguiella Yamaguti, 1959 | Testes in two groups, anterior to ovary. | armed | cirrus pouch crosses osmoregulatory canals. | present | ovary bilobed large, posterior | lobated Sac |
| Transvertia n.g. | Testes in single field throughout the proglottid | unarmed | Not reaches the ventral longitudinal excretory canal. | absent | ovary poral transvers tube like nearly touches the margin anteriosly | Sac like |

## Key to the Genera in Dilepidinae

| | | |
|---|---|---|
| 1a. | Two sets of reproductive organs per segment. | ... Mirandula |
| 1b. | One set of reproductive organs per segment. | ... 2 |
| 2a. | Genital pores unilateral | ... 3 |
| 2b. | Genital pores alternating | ... 22 |
| 22a. | Rostellum lacking | ... 23 |
| 22b. | Rostellum present, armed or not . | ... 25 |
| 25a. | Rostellum unarmed | ... 26 |
| 25b. | Rostellum armed | ... 28 |
| 28a. | Genital pores alternating regularly. | ... 29 |
| 28b. | Genital pores alternating irregularly. | ... 37 |
| 37a. | One circle of rostellar hooks. | ... 38 |
| 37b. | Two circles of rostellar hooks. | ... 44 |
| 38a. | Circle of hooks wavy or zigzag | ... 39 |
| 38b. | Circle of hooks regular | ... 41 |
| 41a. | Ovary posterior. Testes in two lateral fields | ... Laterorchites |
| 41b. | Ovary about central | ... 42 |
| 41c. | Ovary anterior transverse tube like in poral region near the VIEC. | ... TransvertiaN.G. |

Transvertia Kareyraensisn.g., n.sp.

Fig. 1 Scolex ( 5 x 10 )

Fig. 2 Rostellar hook (10 x 45 )

Fig. 3 Mature proglottid ( 10 x 10 )

Fig. 4 Gravid proglottid ( 10 x 10 )

Fig. 5 Egg ( 10 x 45 )

Abbreviations – B, blade; CP, cirrus pouch; E, egg; G, guard; GA, genital atrium; H, handle; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook; RS, receptaculum seminis; S, sucker; SC, scolex; T, testes; U, uterus; V, vagina; VG, vitelline gland; VLEC, ventral longitudinal excretory canal.

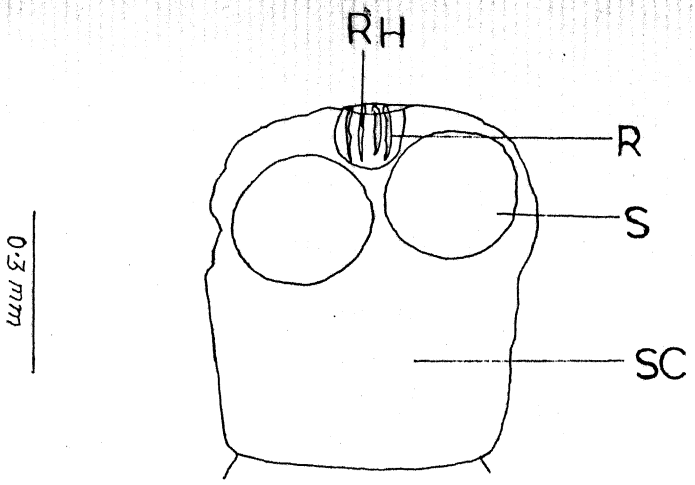



Fig1

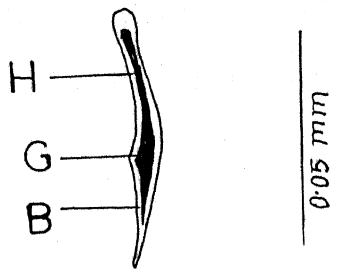



Fig2

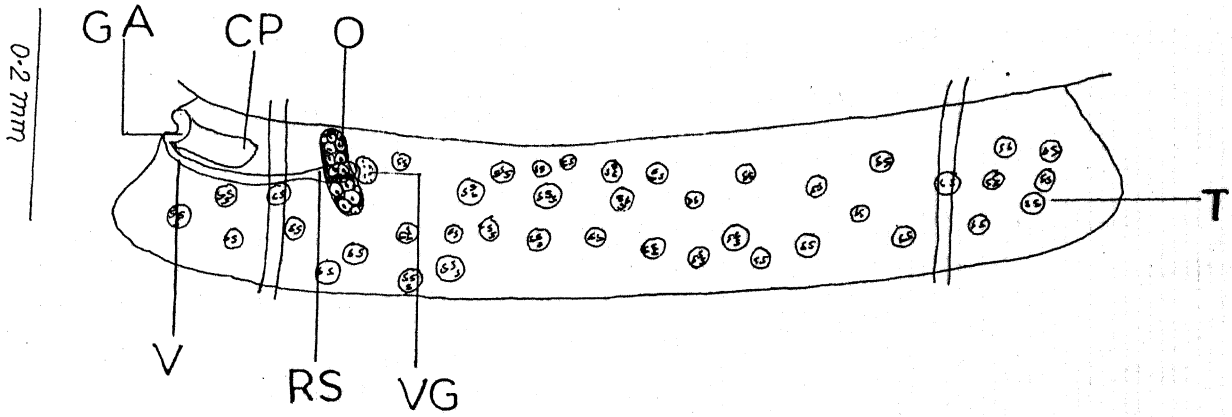



Fig3

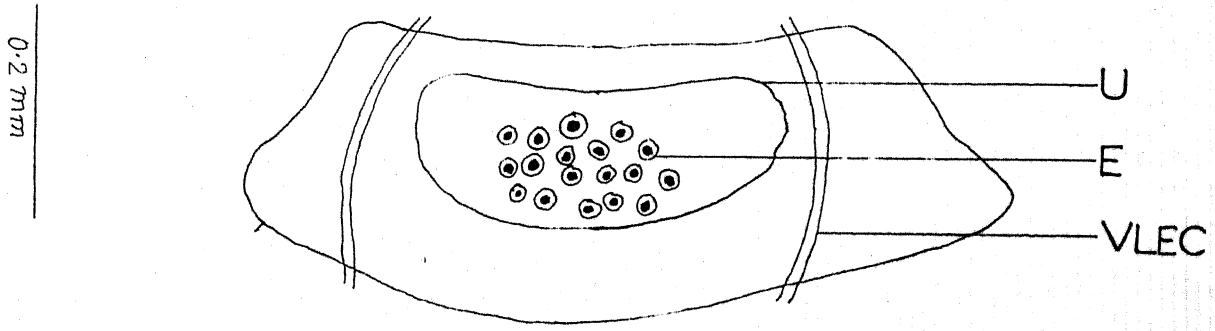



Fig4

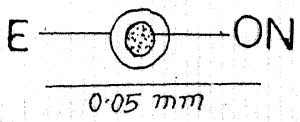



Fig 5

Family : Hymenolepididae Raillet etHenery, 1909

Subfamily : Hymenolepidinae Perrier, 1897

Genus : Armadoskrjabinia Spasskii et spasskaja, 1954

Species : Armadoskrjabinia pande n.sp.
(Figs 1-5;pp- 142)

Two, out of five little grebs, podiceps ruficollis (Pallas) examined at Niwari, District Tikamgarh (M.P.)was found infected with twelve tapeworms from its intestines. The morphological studies of the cestodes revealed them to belong to the genus Armadoskrjabinia Spasskii et Spasskaja, 1954 of the Subfamily Hymenolepidinae Perrier, 1897;family Hymenolepididae Railliet etHenry, 1909.

Cestodes measure 50-70 (60) cm in length and 0.540 in maximum width as seen in the mature proglottids. Proglottids broader than long and craspedote.

Scolex measures 0.240-0.288x0.168-0.258 (0.266x0.213). Suckers four, unarmed,oval to round measure 0.030-0.078x0.030-0.078 (0.054x0.054). Rostellum measure 0.072-0.138x0.066-0.108 (0.105x0.087).Rostellum bears 12 hooks, arranged in single row. Rostellar hooks measure 0.0421-0.0512(0.0466)in length. Handle, 0.0208-0.0288(0.0240); guard, 0.0096 - 0.0160 (0.0128) and blade, 0.0160-0.0224(0.0192) in length.

Neck measures 1.201-1.425x0.120-0.222 (1.31x0.171). Immature proglottids measure 0.018-0.054x0.234-0.372 (0.036x0.303); mature proglottids measure 0.072-0.108x0.390-0.540 (0.090x0.465) and gravid proglottids measure 0.048-0.090x0.150-0.210 (0.069x0.180).

Testes three oval to round measures 0.024-0.042x0.030-0.060(0.033x0.045), in a transvers row which never extand beyond the ventral longitudinal excretory canals. Cirrus pouch elongated measure 0.234-0.288x0.012-0.042 (0.261x0.027), extend beyond the middle of the proglottid width. Cirrus armed measure 0.078-0.102x0.006-0.012 (0.090x0.009). Internal and external seminal vesicles absent.

Female genitalia slightly poral. Ovary blobed measures 0.018-0.042x0.054-0.078 (0.030x0.066). Vitelline gland compact, post ovarian measures 0.006-0.012x0.012-0.024 (0.009x0.018). Vagina posterior to cirrus pouch measures 0.006-0.012 (0.009) in diameter. Receptaculum seminis measure 0.024-0.036x0.006-0.021 (0.030x0.014).

Genital atrium measures 0.012 - 0.024(0.018) deep and 0.012 -0.030(0.021) wide. Genital pores unilateral, located in the middle of the proglottid margin.

Uterus sac like measure 0.024-0.048x0.054-0.078(0.036 x0.066), which never reaches upto the

ventral longitudinal excretory canals. Eggs measure 0.0064-0.0112x0.0064-0.0104 (0.0088x0.0084). Onchospheres measure 0.0016-0.0056x0.0016-0.0048 (0.0036x0.0032).

Ventral longitudinal excretory canals measure 0.006-0.018(0.012) in diameter.

## DISCUSSION

The present form comes closer to Armadoskrjabinia magniuncinata (Meggitt, 1927) Yamaguti, 1959; Armadoskrjabinia nyrocai 1989 Srivastava, B.K. (unpublished thesis) and Armadoskrjabinia parviuncinata Meggitt, 1927.

The present form differs from A. magniuncinata (Meggitt, 1927) Yamaguti,1959 in having larger worms, wider scolex, narrower rostellum, larger rostellar hooks, different arrangement of testes, narrower cirrus pouch and different location of genital pores . Form A.nyrocai Srivastava, B.K., 1989 it differs in having smaller worms, smaller scolex, smaller rostellum, greater number of rostellar hooks, smaller suckers, smaller cirrus pouch, absence of internal and external seminal vesicles, different shape of ovary, presence of receptaculum seminis, uterus in two sacs which never crosses the ventral longitudinal excretory canals. From A.parviuncinata Meggitt, 1927 it differs in having

larger worms, narrower scolex, greater number of larger rostellar hooks, larger cirrus pouch which always reaches upto 2/3rd or proglottid width and position of genital pores.

In the light of the above discussion the present form is accommodated as a new species, Armadoskrjabinia pandein. sp.

The species is named after the eminent Indian Helminthologist, Prof (Dr.) K.C. Pandey, Vice Chancellor of C. C. S. University, Meerut (U.P.)

Host : Podiceps ruficollis(P.)

Habitat : Intestine

Locality : Niwari, Tikamgarh (M.P.)

Holotype : Department of Zoology
Bipin Bihari (P.G.) College,
Jhansi.

Table 14

Comparison of the character of the species closer to A. pandeiin. sp.

| | A.macronuncinata (Mecoitt. 1927) Yamaouti. 1959 | A.myrocalbriweetave B.K.1989 (unpublished thesis) | A.parvinucinate Mecoitt. 1927 | A.pandei n. sp |
|---|---|---|---|---|
| Size | >0.5 | 70–80×0.744 | 4.6×0.3 | 50–70× 0.541 |
| Scolex | 0.16–0.29 dia. | 0.303–0.392×0.301–0.393 | 0.15–0.3 dia | 0.240–0.288 ×0.168–0.258 |
| Rostellum | 0.15 dia | 0.123–0.233×0.068–0.176 | – | 0.072–0.138× 0.066–0.108 |
| Rostellar hooks No. | More than 10 | 10 | 10 | 12 |
| Size | 0.0392 | 0.041–0.055 | 0.013–0.018 | 0.0421–0.0612 |
| Suckers | – | 0.075–0.117× 0.075–0.118 | – | 0.030–0.078× 0.030–0.078 |
| Testes | 1 poral | 1 poral. 2ap- | 1 poral. | 1 poral.2 ap |
| Disposition | 2 poral arranged in triangle | roal arranged in tranevarea row | 2 poral | oral arrange in transver- rse row |
| Size | – | 0.035–0.058× 0.035–0.059 | – | 0.024–0.042× 0.030–0.060 |
| Cirrus | 0.2–0.25× | 0.274–0.392× | 0.11–0.12×0.023– | 0.224–0.288× |

| | A.macruncinata (Meggitt. 1927) Yamaguti. 1959 | A.nyrocaiSrivastava B.K.1989 (unpublished thesis) | A.parvinucinata Meggitt. 1927 | A.bandei n. sp |
|---|---|---|---|---|
| Pouch | 0.05–0.06 reaching half way across proglottid of the VLEC | 0.019–0.062. extend beyond the middle of the proglottid width | 0.028 occasionally cross the VLEC | 0.013–0.042. reaches upto 2/3rd of the proglottid width |
| Internal seminal vesicle | – | present | – | absent |
| External seminal vesicle | – | present | – | absent |
| Ovary | – | transversely extend. 0.006–0.022x0.031–0.075 | – | bilobed 0.016–0.042x 0.054–0.078 |
| Receptaculum seminis | – | absent | – | present |
| Genital pore | In the anterior half of the proglottid margin | In the middle of the proglottid margin | In the anterior half of the proglottid margin | In the middle of the proglottid margin |
| Uterus | – | divided in two sacs. crosses the VLEC | – | divided in two sac never crosses the VLEC |

Armadoskrjabinia pandein.sp.

Fig 1 Scolex (10x10)

Fig 2 Rostellar hook (10x45)

Fig 3 Mature proglottid (10x10)

Fig 4 Gravid proglottid (10x10)

Fig 5 Egg (10x45)

Abbreviations :- B, blade; C, cirrus; CP, cirrus pouch; E, egg; G, guard; H, handle; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook; RS, receptaculum seminis; S, sucker; SC, scolex; T, testes; U, uterus; V, vagina; VG, vitelline gland; VLEC, ventral longitudinal excretary canal.

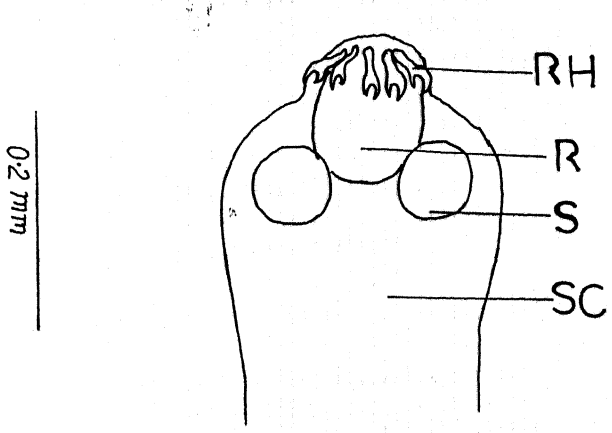



Fig1

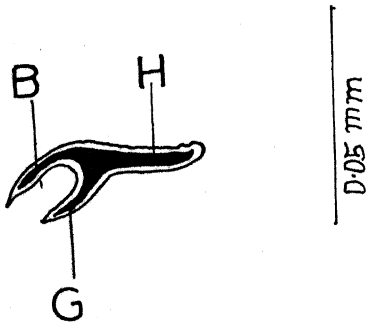



Fig 2

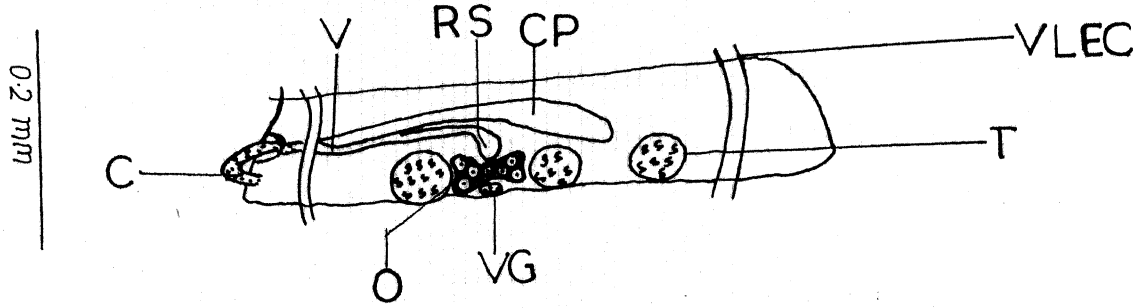



Fig 3

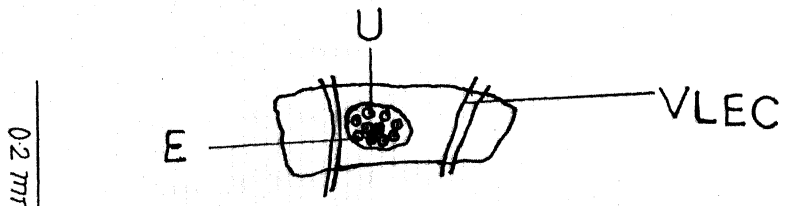



Fig 4

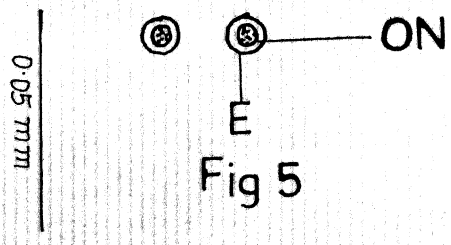



Fig 5

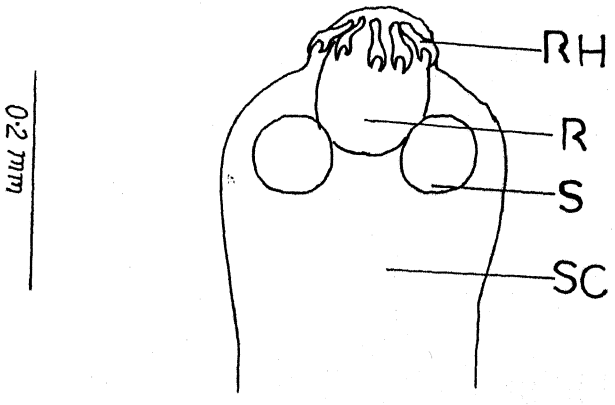



Fig1

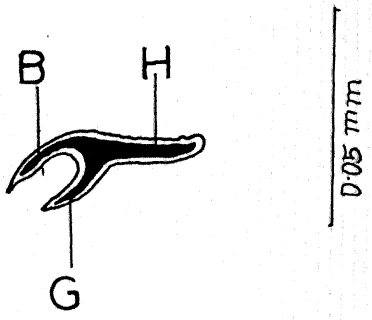



Fig 2

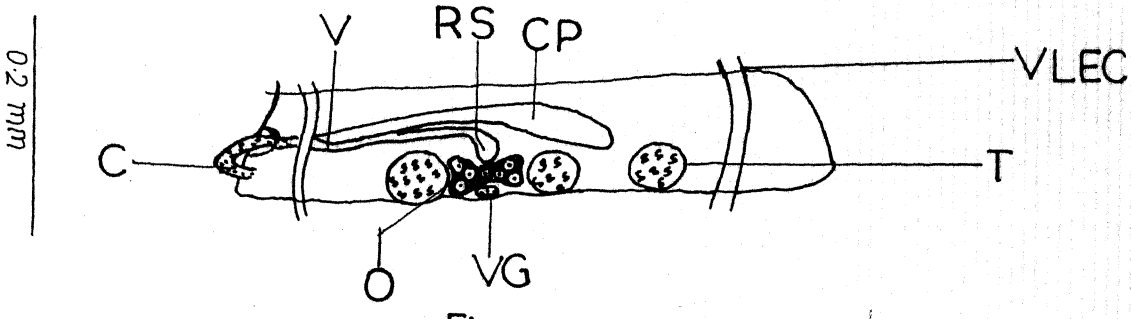



Fig 3

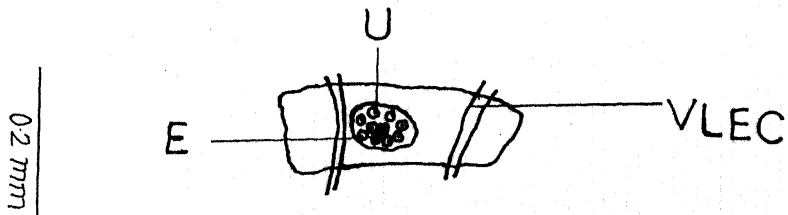



Fig 4

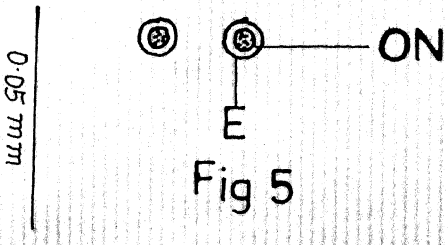



Fig 5

Family : Hymenolepididae Railliet etHenry, 1909

Subfamily : Hymenolepidinae Perrier, 1897

Genus : PesserilepisSpasskii etSpasskaja, 1954

Species : Passerilepis domestican. sp.

(Fig 1-6 PP 151)

Out of eight house sparrows, Passer domesticus (L.) examined at Gwalior (M.P.). One was found infected with two alike cestodes. Cestodes were present in the small intestine of the host. Morphological studies of the cestodes revealed them to belong the genus Passerilepis Spasskii et Spasskaja, 1954 of the subfamily Hymenolepidinae Perrier 1897; family Hymenolepididae Railliet etHenry, 1909.

Cestodes measure 40-47 cm. in length and 0.395 in maximum breadth. Proglottids broader than long and craspedote.

Scolex measures 0.180-0.210x0.174-0.192 (0.195x0.183). Suckers four, oval to round measure 0.078-0.090x0.072-0.084 (0.084x0.078). Rostellum armed, oval shape, protruted measures0.108-0.126x0.057-0.081 (0.117x0.069). Rostellar hooks ten in number arranged in single row measure 0.066-0.072 (0.069) in length. Rostellar hook contains long handle, 0.036-0.039 (0.038); long blade, 0.030-0.033 (0.032) and very short guard, 0.006-0.009 (0.008).

Neck measures 0.276-0.390x0.114-0.132 (0.333x0.123). Immature proglottids measures 0.006-0.042x0.132-0.346 (0.024x0.239); mature proglottids measure 0.032-0.046x0.299-0.395 (0.039x0.347) and gravid proglottids measure 0.0368-0.055x0.299-0.397 (0.046x0.348).

Testes three, oval to round, arranged in triangle measures 0.0115-0.023x0.013-0.025 (0.018x0.019) Cirrus pouch club shape measures 0.036-0.069x0.009-0.025 (0.053x0.017), crosses the ventral longitudinal excretory canal. External seminal vesicle measures 0.018-0.041x0.009-0.018 (0.029x0.013). Internal seminal vesicle absent.

Female genitalia median. Ovary bilobed measures 0.0046-0.018x0.049-0.069 (0.011x0.060). Vitelline gland compact, postovarian measures 0.0046-0.012x0.0138-0.025 (0.007x0.020). Vagina measures 0.003-0.009 (0.006) in diameter. Receptaculum seminis absent.

Uterus begining as a two lobed sac later on forming a single sac measures 0.009-0.036x0.161-0.310 (0.022x0.236). Uterus do not extend beyond the limits of ventral longitudinal excretory canals. Eggs measure 0.005-0.008 (0.007) in diameter. Onchospheres measure 0.0023-0.0046 (0.0034) in diameter.

Genital atrium measures 0.003-0.009 (0.006) deep and 0.009-0.018 (0.014) wide. Genital openings

unilateral, situated in the middle of the proglottids margin.

Ventral longitudinal excretory canals measure 0.0041-0.0092 (0.0067) in diameter.

## Discussion

The present form comes closer to Passerilepis arciuterusYamaguti, 1956, Passerilepis crenata (Goez, 1782) Sawada and Kugi, 1976; Passerilepis japonensis Sawada and Kugi, 1980; Passerilepis nebraskensis Rolen & Laidahl, 1969; Passerilepis Oena (Ortlepp, 1938) Spasskii etSpasskaja, 1954; Passerilepis septamsororum (Burt, 1944) Yamaguti, 1959; Passerilepis taiwanensis (Yamaguti, 1935) Spaskii et Spasskaja, 1954; Passerilepis turdoviliDaisy Rani, 1993 (unpublished thesis) and Passerilepis zosterpis (Fuhrmann, 1918) Spasskii etSpasskaja, 1954.

The present forms differs from P.arciuterus Yamaguti, 1956 it differs in having narrower worms, narrower Scolex, wider rostellum, larger rosteller hooks, persence of neck, larger testes, smaller cirrus pouch smaller vitelline gland, absence of receptaculum seminis, smaller ovary and smaller eggs. From P.crenata (Goez, 1782) Sawada and Kugi, 1976 it differs in having small worms, narrower scolex, longer rostellum, larger rostellar hooks, smaller neck, smaller cirrus pouch, narrower ovary, narrower vitelline gland, absence of

receptaculum seminis and smaller eggs. From P. japonensis Sawada and Kugi, 1980 it differs in having smaller worms, larger scolex, wider rostellum, larger rostellar hooks, narrower neck, smaller testes, smaller cirrus pouch, narrower ovary, smaller vitelline gland, absence of receptaculum seminis and smaller eggs. From P. nebraskensisRolen and Laidahl, 1969 it differs in having wider scolex, wider rostellum, larger rostellar hooks and smaller cirrus pouch. From P. Oena (Ortlepp, 1938) Spasskii etSpasskaja, 1954 it differs in having smaller worms, smaller scolex, wider rostellum, larger rostellar hooks, shorter neck, smaller testes, smaller cirrus pouch, narrower vitelline gland and smaller eggs. From P. septamsororum(Burt, 1944) Yamaguti, 1959 it differs in having narrower worms, narrower scolex, wider rostellum, smaller testes, smaller cirrus pouch, smaller vitelline gland, absence of receptaculum seminis and smaller eggs. From P. taiwanensis (Yamaguti, 1935) Spasskii etSpasskaja, 1954 it differs in having narrower worms, narrower scolex, larger rostellar hooks, larger neck, smaller testes, smaller cirrus pouch, smaller ovary, smaller vitelline gland, absence of receptaculum seminis and smaller eggs. From P. turdovili Rani, Daisy, 1993 in having narrower worms, wider scolex, larger rostellar hooks, longer neck, smaller testes, smaller cirrus pouch, smaller ovary, smaller vitelline gland, absence of receptaculum

seminis and smaller eggs. From P. zosterpis (Fuhrmann, 1918) Spasskii etSoasskaja, 1954 it differs in having narrower worms, smaller testes smaller cirrus pouch, narrower ovary, narrower vitelline gland, absence of receptaculum seminis and smaller eggs.

In the light of above discussion it is proposed to accommodate the present form as a new species, Passerilepis domestican.sp.

Host : Passer domesticus(L.)

Habitat : Small Intentine

Locality : Gwalior (M.P.)

Holotype : Department of Zoology,
Bipin Bihari (P.G.) College, Jhansi

Table 15

Comparison of the character of the species closer to Passerilepis domestican. sp.

| | Size | Scolex | Sucker | Rost-ellum | Rostellar hooks | Neck |
|---|---|---|---|---|---|---|
| P. arcuterus Yamaguti.1956 | 30×0.75 | 0.275 | 0.18×0.084 | 0.12×0.045 | 0.033 | Absent |
| P.crenata (Goez.1782) Sawada and Kugi 1976 | 80-86× 1.1-1.8 | 0.18-0.21× 0.21-0.25 | 0.084-0.098 | 0.042-0.077× 0.070-0.084 | 0.024 | 0.32-098× 0.098-0.16 |
| P.japonensis Sawada & Kugi. 1980 | 110-2.3 | 0.084×0.091 | 0.084-0.091× 0.077-0.084 | 0.112×0.056 | 0.030 | 0.224 |
| P.nebraskensis Rolan & Leidahl 1969 | - | 0.145 | - | 0.053 | 0.0132 | - |
| P.oena(Orsleep. 1938)Spassky et Spasskaja, 1954 | 76-94× 1.6-1.9 | 0.1-0.24 | 0.1-0.12× 0.086-0.09 | 0.035 | 0.041-0.05 | 0.38-0.75 x0.087-0.1 |
| P.septempororum (Burt.1944) Yamaguti. 1959 | 20-30× 0.72 | 0.22 | 0.078-0.082 | 0.085×0.055 | - | - |
| P.taiwanensis (Yamaguti.1935) Spassky et Spasskaja.1954 | 36×0.96 | 0.18-0.210 | 0.08-0.1 | 0.09×0.054 | 0.033-0.035 | 0.25-0.38× 0.1-0.12 |
| P.turdovili Rani dasv. 1993 | 1.5-3.0× 0.680 | 0.182-0.210× 0.126-0.138 | 0.056-0.081× 0.056-0.062 | 0.070-0.120× 0.028-0.070 | 0.03-0.035 | 0.169-0. 182×0.126 -0.140 |
| P.costaricis (Fuhr.1918) Spassky et Spasskaja.1954 | 2.2×0.7 | 0.2 | - | - | - | - |
| P.domestica n.sp | 40-47× 0.395 | 0.180-0.210× 0.174-0.192 (0.195×0.183) | 0.078-0.090 x0.072-0.084 (0.084×0.078) | 0.108-0.126 x0.057-0.081 (0.117-0.069) | 0.066-0.072 (0.069) | 0.276-0.390× 0.114-0.132 (0.333×0.123) |

| | Testes | Cirrus pouch Size | Ovary | Vitelline gland | Receptaculum seminis | Eggs |
|---|---|---|---|---|---|---|
| P.arciuterus Yamaguti.1956 | 0.050-<br>0.100x<br>0.060-0.110 | 0.12-0.17x<br>0.030-0.060<br>- | 0.1-0.21x<br>0.18-0.30 | 0.040-0.050x<br>0.050-0.090 | 0.050-0.120 | 0.065-<br>0.078x<br>0.057-<br>0.072 |
| P.crenata (Goaz.1752) Sawada and Kugi. 1976 | - | 140-0.154x<br>0.035-0.042 | 0.140 | 0.035x0.042 | 0.063-0.077x<br>0.049-0.056 | 0.088-<br>[illegible]-0.074-<br>0.061 |
| P.japonensis Sawada & Kugi,1980 | 0.1[illegible]-0.144x<br>0.192-0.214 | 0.231-0.245x<br>0.063 | 0.245-0.252 | 0.052-0.07[illegible]x<br>0.065-0.070 | 0.154-0.[illegible]x<br>0.049-0.05[illegible] | 0.101-<br>0.105x<br>0.112-<br>0.119 |
| P.nebraskensis Rolan & Leidahl. 1962 | - | 0.297-0.047 | - | - | - | - |
| P.penaforai (Ortlepp. accral 1938) Spasskii et Spasskaja. 1954 | 0.077-0.08<br>0.1x0.052 &<br>0.08x0.035 | 0.2-0.25x<br>0.072 | - | 0.05-<br>0.056 | - | Outer 0.045-0.048<br>Middle 0.03-0.033<br>in shell 0.015 |
| P.septemsororum (Burt.1944) Yamaguti.1959 | 0.110-0.125 | 0.113-0.122x<br>0.037-0.044 | - | 0.07 | 0.16-0.18x<br>0.13-0.14 | 0.041-0.051 |
| P.taiwanensis (Yamaguti, 1935) Spasskii et Spasskaja. 1954 | 0.11 | 0.13-0.14x<br>0.04-0.056 | 0.15-0.18x<br>0.22-0.24 | 0.06-0.07x<br>0.06-0.1 | 0.13-0.22x<br>0.13-0.18 | 0.66-0.087x<br>0.048-0.069 |
| F.turdovili Rani daisy. 1993 | 0.02-0.05 | 0.098-0.140x<br>0.020-0.030 | 0.03-0.07x<br>0.04-0.090 | 0.014-0.030x<br>0.028-0.030 | 0.01-0.02x<br>0.01-0.015 | 0.015-0.022 |
| F.zostarpis (Fuhrmann 1918) Spasskii et spasskaja. 1954 | 0.05-0.06 | 0.12-0.14 | 0.16 | 0.06 | 0.7 | 0.06 |
| F.domestica n. sp. | 0.0115-0.023x<br>0.013-0.025<br>(0.018x0.019) | 0.036-0.069<br>0.009-0.025<br>(0.053x0.017) | 0.046-0.018x<br>0.049-0.069<br>(0.011x0060) | 0.0046-0.012x<br>0.0138-0.025<br>(0.007x0.020) | absent | 0.005-0.008 |

Passerilepis domestican.sp

| | | |
|---|---|---|
| Fig 1 | Scolex with neck | (10x10) |
| Fig 2 | Rostellar hook | (10x45) |
| Fig 3 | Mature proglottid | (15x10) |
| Fig 4 | Gravid proglottid | (15x10) |
| Fig 5 | Gravid proglottid | (15x10) |
| Fig 6 | Egg | (10x45) |

Abbreviations :- B, blade; CP, cirrus pouch; E, egg; EVS, external seminal vesicle; G, guard; GA, genital atrium; H, handle; N, neck; O, Ovary; ON, onchospheres; R, rostellun; RH, rostellar hook; S, sucker; SC, scolex; T, testes; U, uterus; V, vagina; VG, vitelline gland; VLEC, ventral longitudinal excretory canal.

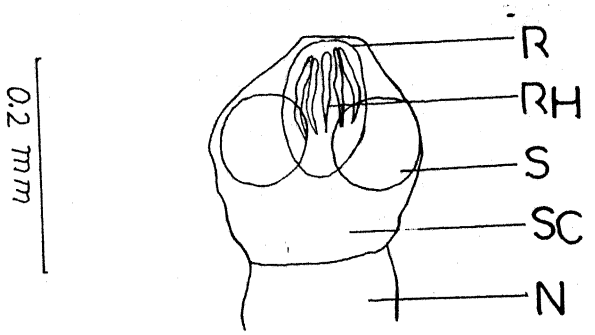



Fig1

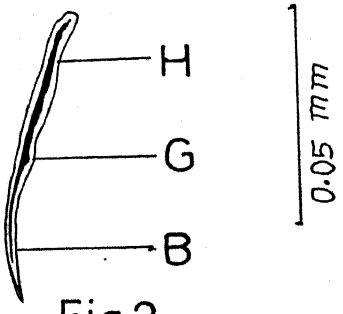



Fig 2

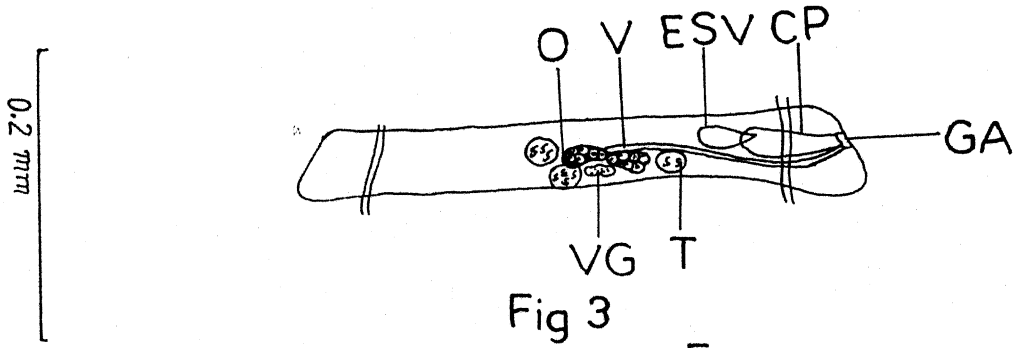



Fig 3

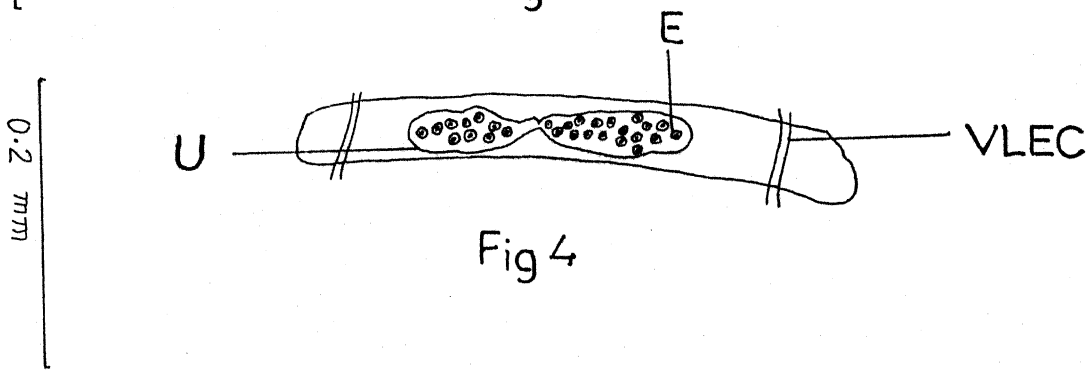



Fig 4

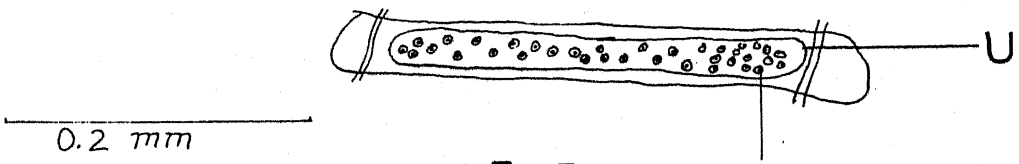



Fig5 E

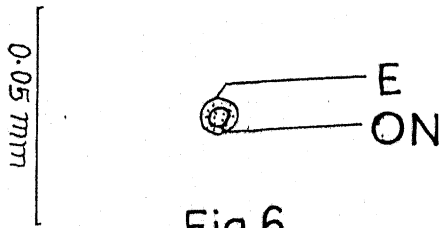



Fig 6

*Passerilepis domestica* n.sp.

Family : Hymenolepididae Railliet etHenry, 1909.

Subfamily : Hymenolepidinae Perrier, 1897.

Genus : Hardayalin.g.

Species : Hardayali anasin.g. n.sp.

(figs. 1-4, PP-161)

Out of seven blue winged teal, Anas querquedula (Linnaeus), examined at Niwari District Tikamgarh (M.P.), two were found infected with two cestodes in their intestines. The morphological studies of the cestodes revealed them to belong to the new genus Hardayali and a new spacies Hardayali anasi n.sp. of the subfamily Hymenolepidinae Perrier, 1897; family Hymenolepididae Railliet etHanry, 1909.

## Hardayalin.g.

Generic Diagnosis:

Subfamily Hymenolepidinae, family Hymenolepididae: medium sized worm. One set of reproductive organ. Scolex with an armed rostellum. Proglottids craspedote. Testes three, arranged in triangle. Genital pores unilateral. Reproductive organs present only on posterior proglottids. Ovary bilobed obliquely. Vitelline gland large, postovarian. Vagina opens anterior to cirrus pouch . Uterus sac like with in the limits of ventral longitudinal excretory canals. Parasites of aquatic birds.

Hardayali anasin.g., n.sp.

Cestodes measure 50-60 (55) cm in length and 0.780 in maximum width as seen in the mature proglottids. Proglottids broader than long and craspedote.

Scolex measures 0.420-0.450x0.405-0.451(0.435x0.428). Suckers four, unarmed, oval to round measures 0.184-0.201x0.143-0.214(0.193x0.179). Rostellum oval armed measures 0.190-0.210x0.164-0.181(0.201x0.172).Rostellum bears 16-20 rostellar hooks arranged in single row measuring 0.096-0.128(0.112) in length. Handle and blade approximately equal in length, but guard very short. A handle, 0.054-0.078(0.066); a blade, 0.042-0.054(0.048)and a guard, 0.006-0.008(0.007) in length .

Neck prominent measures 1.050-1.125x0.195-0.224 (1.080x0.210). Immature proglottids measure 0.054-0.102x0.228-0.558 (0.078x0.393);mature proglottids measure 0.204-0.288x0.570-0.781 (0.246x0.675) and gravid proglottids measure 0.156-0.240x0.612-0.708 (0.198x0.661).

Reproductive organs only in posterior proglottids. Testes three, oval to round triangular, in the anterior half of the proglottid which never crosses the ventral longitudinal excretory canals. Testes measures

0.072–0.144x0.054–0.138(0.108x0.096).Cirrus pouch measures 0.078 – 0.144 x 0.018 – 0.054 (0.111x0.036), crosses the poral ventral longitudinal excretory canals. Internal and external seminal vesicles absent .

Female genitalia median ovary obliquely bilobed measures 0.042–0.108x0.192–0.246 (0.075x0.219). Vitelline gland large, compact postovarian measures 0.030–0.084x0.042–0.090 (0.057x0.066). Vagina measures 0.004–0.016 (0.011) in diameter anterior to cirrus pouch opens into the genital atrium. Receptaculum seminis measure 0.072–0.108x0.024–0.048 (0.090x0.036), situated at the proximal end of vagina.

Genital atrium measures 0.018–0.048 (0.033) deep and 0.024–0.048(0.036)wide. Genital openings unilateral, situated in the middle half of the proglottid margin.

Uterus persistant measures 0.126–0.210x0.408–0.564(0.168x0.486), within the limits of ventral longitudinal excretory canals. Eggs measure 0.006–0.014x0.006–0.014 (0.010x0.010).

Ventral longitudinal excretory canals measure 0.006–0.018(0.012) in diameter.

## DISCUSSION

According to Schmidt, 1986 the cestodes belong to the family Hymenolepididae Railliet etHenry, 1909 On the basis of genital ducts, seminal vesicles, disposition of testes and vitellarium. It comes closer to CladogyniaBear, 1937 and DilepidoidesSpasskii et spasskaja, 1954.

The present form differs from Cladogynia Baer, 1937 in having presence of triangular testes presence of cirrus pouch, absence of vas diferens different shape and extension of ovary, simple vitelline gland, vaginal pore anterior to cirrus pouch and sac like uterus which never crosses the ventral longitudinal excretory canals. From Dilepidoides Spasskii et Spasskaja, 1954 it differs in having triangular testes, unarmed cirrus, absence of internal seminal vesicle, absence of vas deferens, obliquely located ovary and shape of receptaculum seminis.

In the light of above discussion the present form is accommodated as a new genus, Hardayaliand a new species, Hardayali anasin.g., n.sp.

The genus is named in honour of Late Dr.H.D.Srivastava an eminent Indian Helminthologist.

| | | |
|---|---|---|
| Host | : | Anas querquedula(L) |
| Habitat | : | Intestine |
| Locality | : | Niwari , Tikamgarh (M.P.) |
| Holotype | : | Department of Zoology , Bipin Bihari (P.G.) College, Jhansi |

Table -16

Comparison of the characters of various genera closer to Hardayalin.g

| | CladogyniaBear, 1937 | DilepidoidesSpasskii et Spasskaja, 1954 | Hardayali anasin.g. n.sp. |
|---|---|---|---|
| Testes | Three in transverse row | Three in Transverserow | three in triangl |
| Cirrus | Absent | Armed with six sizes of spines | absent |
| Cirrus pouch | Absent | Cirrus pouch long,slender or claviform . | Cirrus pouch small, club shape crosses the ventral longitudinal excretory canal. |
| Internal seminal vesicle | Absent | Present | Absent |
| Vas deferens | Present | Strongly convoluted | Absent |
| Ovary | Ovray strongly branched, extending transversely in ventral medulla across | bilobed, median | oblique, bilobed |
| Vitelline gland | Strongly branched, median | postovarian | Postovarian, deer shaped. |
| Vagina | Ventral to male apparatus | Strongly developed thick walled | Anterior to cirrus pouch |
| Receptaculum seminis | Elongate, almost cylindrical | Rounded | Elongated, club shaped |
| Uterus | Reticular, dorsal to ovary, crossing lateral canals. | Reticulate | Saclike persistant |

## KEY TO THE GENERA IN HYMENOLEPIDINAE

1a. Two sets of reproductive organs in each proglottids ....Diplogynia

1b. One set of reproductive organs per proglottid ....2

2a. Suckers absent from scolex ....Acotylopepis

2b. Suckers present on scolex (may be vestigial) ....3

3a. One testes per proglottid ....4

3b. More than one testes per proglottid ....7

7a. Two testes per proglottid ....8

7b. More than two testes per proglottid ....16

16a. Three testes per proglottid ....17

16b. More than three testes per proglottid ....70

17a. Suckers armed ....18

17b. Suckers unarmed ....21

21a. Rostellum absent or rudementory, unarmed ....22

34a. External segmentation lacking, Internal segmentation conspicuous ....Parafimbriaria

34b. External segmentation evident ....35

35a. Five pairs of osmoregulatory canals ....Hymenofimbrice

35b. Two pairs of osmoregularoty canals ....36

36a. Rostellum with many small hooks behind apical circle ....37

36b. Rostellum with only one (rarely two) circles of hooks ....38

38a. Scolex with huge hemispherical rostellum armed near its base with a circle of 80 to 90 hooks ....Hilmylepis

38b. Scolex not as above ....39

39a. All three testes poral to ovary ....Drepanid-
otaenia

39b. Testes not as above ....40

40a. Uterus reticulate ....Flaming-
olepis

40b. Uterus not reticulate ....41

41a. Gravid uterus forming two sacs,
which may be joined by narrow isthmus ....42

41b. Gravid Uterus not as above ....43

43a. Parasites of mammals ....44

43b. Parasites of birds ....49

49a. Antiporal margin of strobila
strongly fimbrieted ....Hispaniolepis

49b. Lateral margins of strobila similar ....50

50a. Poral and most antiporal testes outside
osmoregulatory canals, persistent;
developing uterus nearly surrounds them ....Oshm-
arinolepis

50b. Testes and Uterus not as above ....51

51a. Genital atrium with accessory sacs ....52

51b. Genital atrium without accessory sacs ....60

60a. Ovary reticular ....Avocett-
olepis

60b. Ovary not reticular ....61

61a. Internal and external seminal
vesicles absent ....62

61b. At least one seminal vesicle present ....63

62a. Cirrus pouch absent, replaced by a
complex ejaculatory duct ....Cladogynia

62b. Cirrus pouch present ....Dilepidoides

62c. Testes triangular, cirrus pouch small
cirrus without spines ...Hardayali n.g.

Hardayali anasi

Fig 1 Scolex with neck (10x10)

Fig 2 Rostellar hooks (15x10)

Fig 3 Mature proglottid (10x10)

Fig 4 Gravid proglottid (10x10)

Abbreviations :- B, blade; CP, cirrus pouch; E, egg; G, guard; GA, genital atrium; H, handle; N, neck; O, ovary; R, rostellum; RH, rostellar hooks; RS, receptaculum seminis; S, sucker; SC, scolex; T, testes; U, uterus; V, vagina; VG, vitelline gland; VLCE, ventral longitudinal excretory canal.

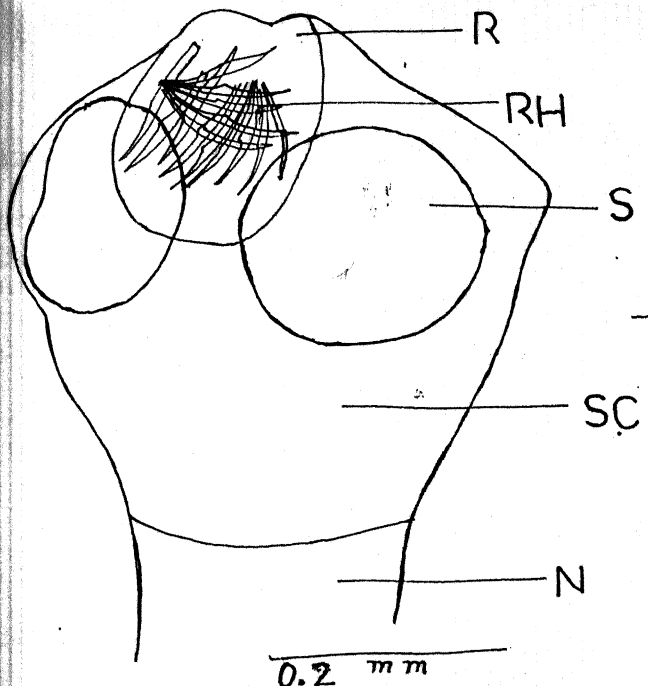



Fig1

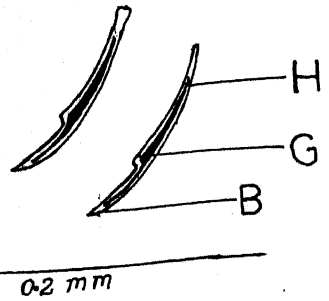



Fig2

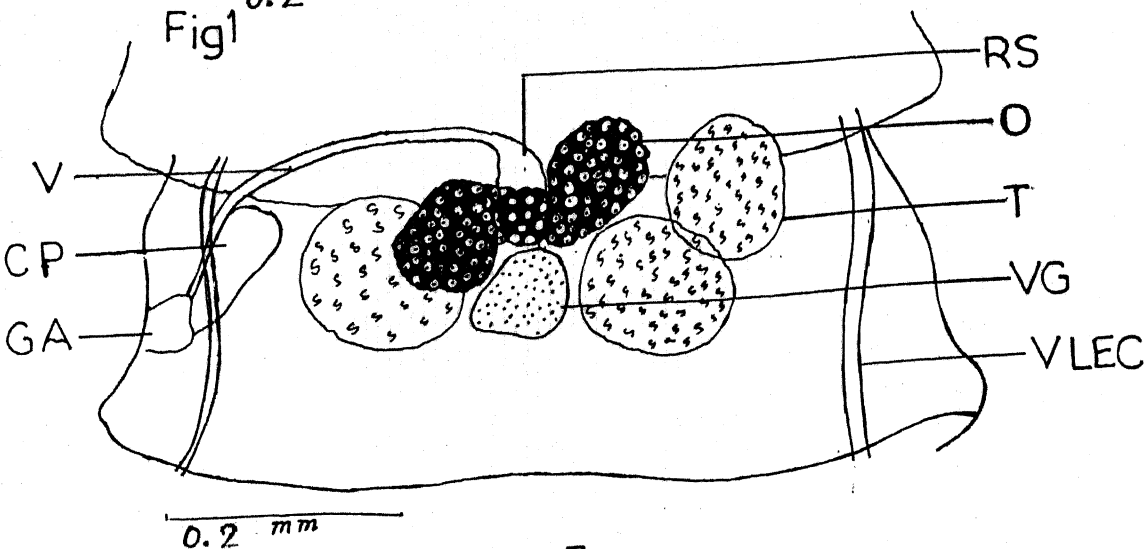



Fig 3

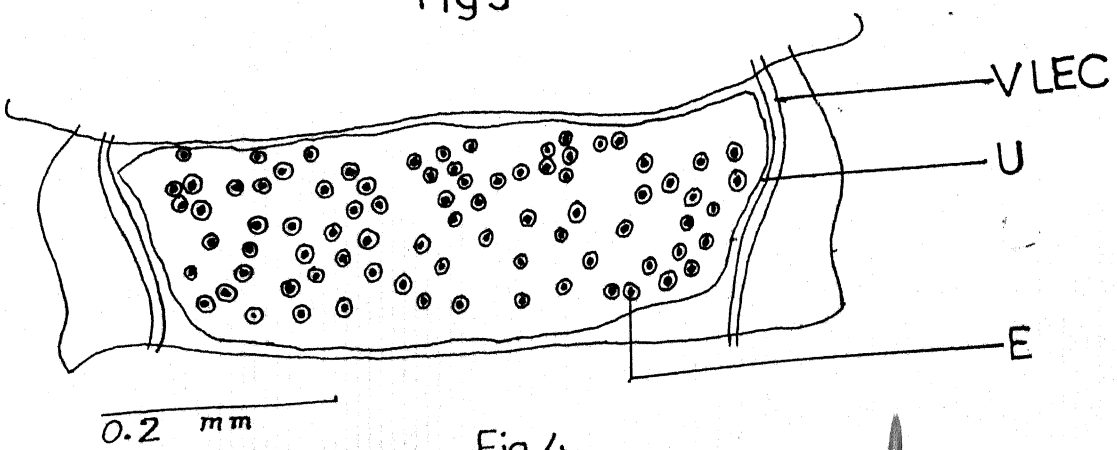



Fig 4

Family : Hymenolepididae Railliet etHenry, 1909

Subfamily : Hymenolepidinae Perrier, 1897

Genus : DicranotaeniaRailliet, 1892

Species : Dicranotaenia acutan.sp.

(Fig 1-5, PP 169 )

Out of four Dighonch, Anas acuta(Linn.) examined at District Guna (M.P.), one was found with six alike cestodes from the intentine of the host. The morphological studies of the cestodes revealed them to belong to the genus DicranotaeniaRailliet, 1892 of the subfamily Hymenolepidinae Perrier, 1897; family Hymenolepididae Railliet etHenry, 1909.

Cestodes measures 30-48 cm in length and 0.430 in maximum breadth as seen in gravid proglottids. Strobila consists of number of Proglottids which are broader than long.

Scolex well demarcated from the neck. Scolex measures 0.165-0.206x0.144-0.168 (0.186x0.156). Suckers oval to round, unarmed measure 0.056-0.068x0.056-0.068 (0.062x0.062). Armed rostellum measures 0.090-0.108x0.075-0.090 (0.099x0.083). Rostellar hooks 18-20 in number, arranged in single row measure 0.0290-0.0420 (0.035) in length. Hooks bear a handle, 0.018-0.027 (0.023); a blade, 0.015-0.021 (0.018) and a guard, 0.012-0.018 (0.015) in length.

Neck measures 0.540–0.660x0.078–0.096 (0.601x0.087). Immature proglottids measure 0.018–0.036x0.126–0.204 (0.027x0.165); mature proglottids measure 0.042–0.108x0.216–0.338 (0.075x0.304) and gravid proglottids measure 0.054–0.102x0.288–0.442 (0.075x0.316).

Testes oval to round measures 0.012–0.018x0.015–0.024 (0.015x0.020). Testes arranged in triangle, one poral and two aporal, within the limits of ventral longitudinal excretory canals. Cirrus pouch reaches upto aporal ventral longitudinal excretory canal. Cirrus pouch measures 0.210–0.295x0.012–0.036 (0.253x0.024). Internal seminal vesicle measures 0.114–0.161x0.009–0.031 (0.141x0.021). External seminal vesicle absent.

Female genitalia slightly aporal.Ovary measures 0.010–0.024x0.036–0.054 (0.018x0.041).Vitelline gland compact, postovarian, measures 0.006–0.012x0.009–0.018 (0.009x0.014). Vagina measures 0.009–0.018 (0.014) in diameter. Receptaculum seminis measures 0.042–0.066x0.012–0.023 (0.051x0.018).

Genital atrium measures 0.009–0.018 (0.011) deep and 0.008–0.019 (0.012) wide. Genital openings unilateral and situated in the middle of the proglottid margin.

Uterus sac like measures 0.042-0.068x0.305-0.395 (0.051 x 0.338), laterally extend beyond the limits of ventral longitudinal excretory canals. Egg measures 0.009 - 0.018 x 0.018 - 0.021 (0.012x0.012). Onchospheres measure 0.004-0.007x0.005-0.007 (0.006x0.006). Embryonic hooks measure 0.0064-0.0096 (0.008) in length.

Dorsal longitudinal excretory canals measure 0.009-0.015 (0.012) in diameter and ventral longitudinal excretory canals measure 0.012-0.024 (0.018) in diameter.

## Discussion

The present form comes closer to Dicranotaenia aequabilis (Rud., 1810) Lopez-Neyra, 1942; Dicranotaenia alcippina Srivastav and Capoor, 1980 Dicranotaenia amphitricha (Rud, 1819) Lopez Neyra, 1942; Dicranotaenia fryci Mayhew, 1925) Syn. Hymenolepis californicus Young, 1950; Dicranotaenia microcirrosa (Mayhew, 1925) Lopez-Neyra, 1942; Dicranotaenia minisacculata Macko, 1991; Dicranotaenia recurvirostroides (Meggitt, 1927) Yamaguti, 1959; Dicranotaenia stenosacculata Macko, 1991 and Dicranotaenia uragahaensis(Burt, 1944) Yamaguti, 1959.

The present form differs from D.aequabilis (Rud., 1810) Lopez-Neyra, 1942 in having smaller worms,

narrower scolex, longer rostellar hooks, narrower suckers, smaller cirrus, pouch, absence of external seminal vesicles and smaller eggs. From D.alcippina Srivastav and Capoor, 1980 in having smaller worms, narrower scolex, wider rostellum, longer rostellar hooks, narrower suckers, disposition of testes, longer cirrus pouch which reaches upto aporal ventral longitudinal excretory canal, absence of external seminal vesicles and smaller eggs. From D.amphitricha (Rud., 1819) Lopez-Neyra, 1942 in having longer worms, wider scolex wider rostellum, longer rostellar hooks, wider suckers, smaller cirrus pouch and smaller eggs. From D.fryei (Mayhew, 1925) Syn. Hymenolepis californicusYoung, 1950 in having smaller worms, wider scolex, larger rostellar hooks, disposition of testes, cirrus pouch reaches upto aporal ventral longitudinal excretory canal, absence of external seminal vesicle and smaller eggs. From D.microcirrosa (Mayhew, 1925) Lopez-Neyra, 1942 in having narrower worms, wider scolex, narrower rostellum larger rostellar hooks, cirrus pouch reaches upto aporal ventral longitudinal excretory canal, absence of external seminal vesicle and smaller eggs. From D.minisacculataMacko, 1991 in having smaller worms, narrower scolex, smaller rostellar hooks, narrower suckers, disposition of testes, cirrus pouch reaches upto aporal ventral longitudinal excretory canals, presence of internal

seminal vesicle, absence of external seminal vesicle. From D. recurvirostroides Meggitt, 1927 Yamaguti, 1959 in having narrower worms, wider scolex, wider rostellum, larger rostellar hooks, testes arranged in triangle and larger cirrus pouch reaches upto aporal ventral longitudinal excretory canals. From D.stenosacculata Macko, 1991 in having smaller worms, narrower scolex, narrower rostellum larger rostellar hooks, testes arranged in triangle, cirrus pouch reaches upto aporal ventral longitudinal excretory canal and absense of external seminal vesicles and from D.uragahaensis (Burt, 1944) Yamaguti, 1959 in having narrower worms, narrower scolex, longer rostellum, larger rostellar hooks, narrower suckers, longer cirrus pouch reaches upto aporal ventral longitudinal excretory canal, absence of external seminal vesicle and smaller eggs.

In the light of above discussion the present form is accommodated as a new species, Dicranotaenia acuta n. sp.

Host : Anas acuta(L)

Habitat : Intestine

Locality : Guna (M.P.)

Holotype : Department of Zoology, Bipin Bihari (P.G.) College, Jhansi

TABLE 17

Comparison of the characters of the species closer to Dicranotaenia acuta n. sp.

| | D. aequabiles (Red., 1810) Lopez-Neyra, 1942 | D. alcipina Srivastav & Capoor,1980 | D. amphitricha (Rud., 1819) Lopez-Neyra, 1942 | D..fryei (Mayhew 1925),Syn. Hymenolepiscali fornicus Young,1950 | D.Microcirrosa (Mayhew,1925) Lopez- Neyra, 1942 | D.minisaclulata, Macko 1991 | D.recurvirostroides (Meggitt, 1927 Yamaguti, 1959 | D.stenosacculata Macko,1991 | D.uragaha ensis (Burt,1944) Yamaguti, 1959 | D.acuta n. sp. |
|---|---|---|---|---|---|---|---|---|---|---|
| Size | 204-430 x 3.5-5.2 | 35.0-60.0x 0.921 | 110.0 (L) | 115.0x1.0 | 30.0-36.0x 2.0 | 240x5 | 30.0x0.8 | 116 x 1.4 | 17.0-25.0x 0.62-0.74 | 30-48x 0.430 |
| Scolex | 0.274 | 0.152-0.256 | 0.125 | 0.106 | 0.1 | 252-295 | 0.13 | 0.253 | 0.187-0.214 | 0.144-0.168 |
| Rostellum | - | 0.064-0.102x 0.043-0.057 | 0.045 | - | 0.2 | 156-168x 73-84 | 0.04 | 0.052 | 0.042-0.048x 0.085 | 0.090-0.108x 0.075-0.090 |
| Rostellar hooks | 0.028-0.032 | 0.019-0.028 | 0.022 | 0.017-0.019 | 0.0112 | 15-16.5 | 0.01-0.015 | 0.013-0.0132 | 0.029-0.030 | 0.0290 - 0.0420 |
| Sucker | 0.11 | 0.057-0.095 | 0.057 | - | - | 72-91 | - | 0.074-0.078 | 0.085-0.099 | 0.056-0.068 |
| Testes disposition | - | irregular | 1 poral & 2 aporal | irregular | Triangle | 2 aporal & 1 poral lateral to ovary | In a straight line | irregular | triangle | triangle 1 poral 2 aporal |
| Cirrus pouch | 0.548x0.137-0.16 | 0.152-0.205x 0.032-0.053 | 0.297-0.32x 0.036-0.037 | - | - | - | 0.096-0.11 x 0.017 | - | 0.1-0.11x 0.031-0.037 | 0.210-0.295x 0.012-0.036 |
| Extension | - | never reaches upto the middle of the proglittid | - | may extend upto middle of the segment. | Some what behind excretory vessel | reaches the VIEC | just reaches upto ventro-lateral excretory canal | Crosses the VLEC | Extend upto middle of the segment | reaches upto aporal VLEC |
| Internal Seminal Vesicle | - | present | present | present | present | absent | - | present | present | present |
| External Seminal Vesicle | present | present | - | present | present | present | - | present | present | absent |
| Egg | 0.037-0.044x 0.022 | 0.02-0.042x 0.03-0.042 | 0.039x 0.028 | 0.037-0.052 x0.026-0.049 | 0.045-0.054 x0.04-0.045 | - | - | - | 0.07-0.084 | 0.009-0.015x 0.018-0.021 |

**Dicranotaenia acuta** n. sp.

Fig 1 Scolex (10x10)

Fig 2 Rostellar hook (10x45)

Fig 3 Mature proglottids (10x10)

Fig 4 Gravid proglottid (10x10)

Fig 5 Egg with embryonic hooks (10x45)

Abbraviations :- B, blade; CP, cirrus pouch; DLEC, dorsal longitudinal excretory canal; E, egg; EH, embryonic hook; G, guard; GA, genital atrium; H, handle; IVS, internal seminal vesicle; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook; RS, receptaculum seminis; S, sucker; SC, scolex; T, testes; U, uterus; V, vagina; VLEC, ventral longitudinal excretory canal.

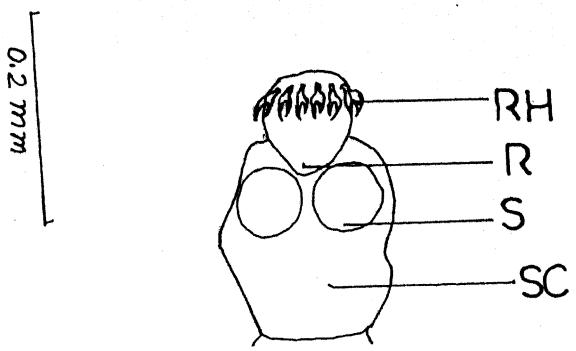



Fig 1

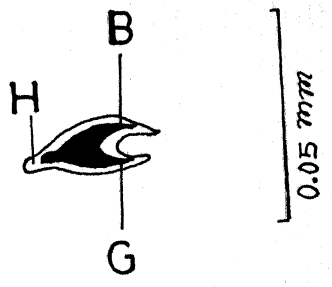



Fig 2

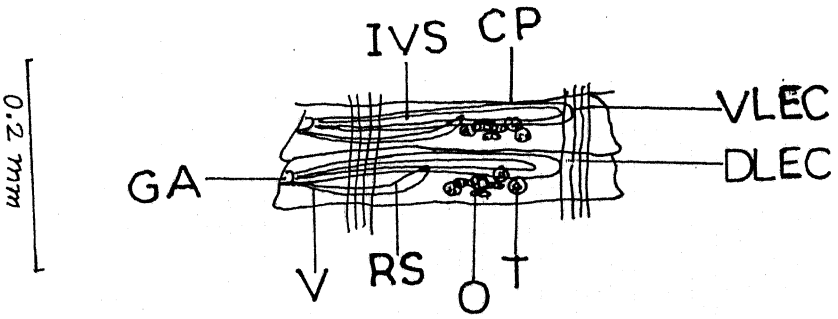



Fig 3

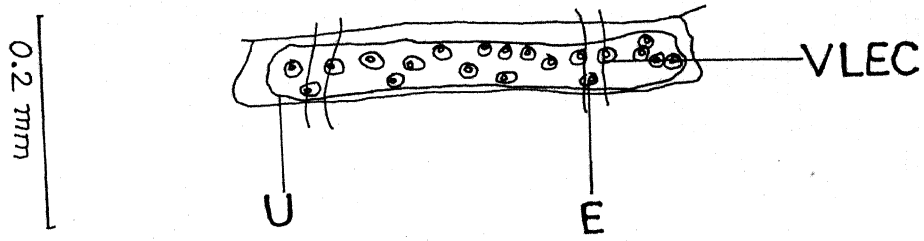



Fig 4

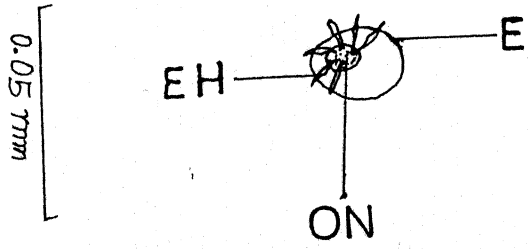



Fig 5

Family : Hymenolepididae Railliet et Henry, 1909

Subfaimly : Hymenolepidinae Perrier, 1897

Genus : VariolepisSpasskii etSpasskaja, 1954

Species : Variolepis lalin.sp.

(Fig 1-5, PP 178 )

One out of four coot, Fulica atra (L.)examined at Bharmau, Distt. Jhansi (U.P.) was found infected with two cestods. Morphological studies of the cestodes revealed them to belong to the genus Variolepis Spasskii et Spasskaja, 1954 of the subfamily Hymenolepidinae Perrier, 1897; family Hymenolepididae Railliet etHenry, 1909.

Cestodes measure 46-59 cm in length 0.660 in maximum width. Proglottids broader than long and craspedote.

Scolex measures 0.204-0.222x0.192-0.210 (0.213x0.201). Suckers four, unarmed, oval to round measures, 0.051-0.060x0.042-0.048 (0.056x0.045). Rostellum protrusible measures 0.108-0.126x0.072-0.090 (0.117x0.081). Rostellar hooks 14 in number measure 0.048-0.060 (0.054) in length. Handle measures 0.0256-0.0320 (0.0288); guard measures 0.0084-0.0106 (0.095) and blade measures 0.0084-0.0108 (0.096) in length.

Neck measures 0.534-0.570x0.102-0.126 (0.552x0.114). Immature proglottids measure 0.018-

0.030x0.150-0.414 (0.024x0.282); mature proglottids measure 0.042-0.078x0.480-0.660 (0.660x0.571) and gravid proglottids measure 0.114-0.144x0.366-0.468 (0.129x0.417).

Testes 3 in number, 1 poral and 2 aporal in a transverse row, oval to round, measures 0.021-0.030x0.024-0.031 (0.026x0.026). Cirrus pouch elongated measures 0.198-0.252x0.012-0.028 (0.225x0.220), do not reache upto mid of the proglottids width. Armed cirrus measures 0.024-0.054x0.006-0.012 (0.039x0.009). External seminal vesicles measure 0.042-0.072x0.006-0.021 (0.057x0.014). Internal seminal vesicles absent.

Female genitalia median. Ovary transversely elongated measures 0.012-0.038x0.132-0.181 (0.025x0.157). Vitelline gland postovarian, compact measures 0.006-0.012x0.024-0.036 (0.009x0.031). Vagina measures 0.006-0.014 (0.010) in diameter. Receptaculum seminis absent.

Genital atrium measures 0.018-0.031 (0.024) wide and 0.006-0.018 (0.012) deep, genital openings unilateral situated in middle of the proglottid margin.

Uterus sac like measures 0.060-0.072x0.180-0.214 (0.066x0.197), never reaches the ventral longitudinal excretory canals. Egg measures 0.015-0.021x0.013-0.022

(0.019x0.018). Onchospheres measure 0.006–0.013x0.007–0.012 (0.010x0.009).

Ventral longitudinal excretory canals measure 0.006–0.013 (0.010) in diameter.

## Discussion

The present form comes closer to *Variolepis hughesi* (Webster, 1947) Yamaguti, 1959; *Variolepis passerus* Tewari, 1987 (unpublished thesis); *variolepis planestici* (Mayhew, 1925) Spasskii et Spasskaja, 1954; *Variolepis tristis* Tewari, 1987 (unpublished Thesis); *Variolepis variabillis* (Mayhew, 1925) Yamaguti, 1954; *Variolepis victariata* (Inamdar, 1934) Spasskii *et* Spasskaja, 1954.

From *V. hughesi* (Webster, 1947) Yamguti, 1959 it differs in having narrower worms, wider scolex, narrower suckers, greater number of larger rostellar hooks, smaller testes, longer cirrus pouch, transverse narrower ovary, narrower vitelline gland, smaller eggs and smaller onchospheres. From *V.passerus* Tewari, 1987 it differs in having longer worms, narrower scolex, narrower rostellum, different shape of greater number of larger rostellar hooks, smaller testes which never reaches upto poral ventral longitudinal excretory canal, narrower cirrus pouch, transverse tube like narrower ovary, smaller simple vitelline gland, absence

of receptaculum seminis, smaller eggs and amaller onchospheres. From *V planisetici* (Mayhew, 1925) Spasskii *et* Spasskaja, 1954 it differs in having longer worms, greater number of larger rostellar hooks, smaller testes, transverse tube like ovary, smaller eggs and smaller onchospheres. From *V. tristis* Tewari, 1987 it differs in having longer worms, narrower suckers, larger rostellum, different shape and greater number of larger rostellar hooks, smaller testes which never reaches upto ventral longitudinal excretory canals, smaller cirrus pouch which clearly crosses the ventral longitudinal excretory canal, different shape of narrower ovary, simple smaller vitelline gland, smaller eggs and smaller onchospheres. From *V. variabilis* (Mayhew, 1925) Yamaguti, 1959 it differs in having longer worms, narrower suckers, wider rostellum greater number of larger rostellar hooks, cirrus pouch reaches more than 1/3rd width of the proglottid and transverse tube like ovary. From *V. victoriata* (Inamdar, 1934) Spasskii *et* Spasskaja, 1954 it differs in having narrower worms, narrower suckers, greater number of larger rostellar hooks, larger testes, narrower cirrus pouch never reaches upto mid of the proglottid width, transverse tube like ovary, smaller eegs and smaller onchospheres.

In the light of the above discussion it is

proposed to accommodate the present form as a new species, *Variolepis lali* n. sp.

The new species is named in the honour of Dr S. S. Lal Prof. & Head of the Zoology Department of C. S. S. University, Meerut.(u.p)

Host : *fulica atra* (L.)

Habitat : Intestine

Locality : Gharmau, Jhansi

Holotype : Department of Zoology
Bipin Bihari (P.G.) College, Jhansi

Table 18

Comparison of the characters of the species closer to Variolapis lali n.sp.

| | V.hughesi (Webster. 1947) Yamaguti. 1959 | V.passerus Tewari.1987 | V.planes tici (Mayhew. 1925) Spasskiiet Spasskaja 1954 | V.tristis Tewari. 1987 | V.variab illis (Mayhew. 1925) Yamaguti, 1959 | V.victo riata Spasskii etspass kaja 1954 | V.lali n. sp. |
|---|---|---|---|---|---|---|---|
| Size | 37-50x1.0 | 10-15x1.1 | 10-35x0.5-1.5 | 21-34x1.4 | 3.0x1.0 | 60x1.35 | 46-59x 0.660 |
| Scolex dia. | 0.144-0.173 | 0.23-0.25 | 0.2 | 0.154-0.198 | 0.2 | 0.2 | 0.192-0.210 |
| Suckers dia. | 0.064-0.082 | 0.08-0.09 | - | 0.042-0.076 | 0.08 | 0.07 | 0.042-0.048 |
| Rost-ellum | 0.04-0.054 | 0.05-0.07x 0.04-0.06 | - | 0.07-0.084x 0.03-0.04 | 0.02 | 0.212x 0.097 | 0.108-0.126x 0.072-0.090 |
| Rostellar hooks | | | | | | | |
| No | 10 | 10 | 10 | 8 | 10 | 10 | 14 |
| Length | 0.014-0.015 | 0.014-0.016 taenia like | 0.014 | 0.017-0.02 chali form | 0.02-0.022 | 0.0228-0.03 | 0.048-0.060 'Y'shape |
| Testes dia | 0.124-0.164 | 0.12-0.17 aporal testes reaches upto VLEC | 0.06-0.08 | 0.028-0.098x 0.056-0.112 poral and aporal testes reaches near | - | 0.014 | 0.024-0.031 in tran sverse row |
| Cirrus pouch | 0.158-0.180x 0.045-0.053 | 0.17-0.24x 0.04-0.07 | - | 0.18-0.2x 0.03-0.04 | - | 0.21x0.043 | 0.198-0.252x 0.012-0.028 |

VLEC

| | V.hughesi (Webster. 1947) Yamaguti, 1959 | V.passerus Tewari,1987 | V.olanes tici (Mayhew, 1925) Spasskiiet Spasskaya 1954 | V.tristis Tewari. 1987 | V.variab illis (Mayhew. 1925) Yamaguti. 1959 | V.victo riata n. Spasskii etspass kaia 1954 | V.lali sp. |
|---|---|---|---|---|---|---|---|
| extension | - | Crossing the VLEC | - | upto or cross the VLEC | 1/3rd width of pro- glottid | Upto mid line of proglottid | never reac- has up to mid dle width of the proglo ttid |
| Ovary Width | 0.278-0.4 bilobed or trilobed | 0.2-0.22 lobulated fan shaped | irregular fan shaped | 0.098-0.294 bilobed each lobe further lobulated. | - | 0.17 | 0.012-0.038× 0.132-0.181 trans- versly elonga- ted |
| Vitel- line gland | 0.078-0.102 | 0.05-0.08× 0.08-0.10 variously lobed | - | 0.028-0.056× 0.042-0.112 variously lobed | - | - | 0.006-0.012× 0.024-0.026 Compact |
| Recept- aculum seminis | - | present | - | absent | - | - | absent |
| Egg | 0.047-0.05 | 0.04-0.07 | 0.035x0.047 | 0.02-0.049 | - | 0.048×0.045 | 0.015-0.021× 0.013-0.022 |
| Uncirc spheres | 0.051-0.057 | 0.02-0.04 | 0.032x0.024 | 0.014-0.029 | - | 0.019 | 0.036-0.013× 0.007- |

*Variolepis lali* n. sp.

| | | |
|---|---|---|
| Fig 1 | Scolex with neck | (10x10) |
| Fig 2 | Rostellar hook | (10x45) |
| Fig 3 | Mature proglottid | (10x10) |
| Fig 4 | Gravid proglottid | (10x10) |
| Fig 5 | Egg | (10x45) |

Abbreviations :- B, blade; C, cirrus; CP, cirrus pouch; E, egg; EVS, external seminal vesicle; G, guard; H, handle; N, neck; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook; S, sucker; SC, scolex; T, testes; U, uterus; V, vagina; VG, vitelline gland; VLEC, ventral longitudinial excretory canal.

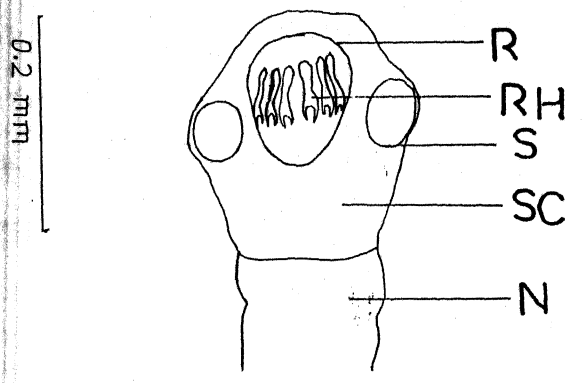



Fig1

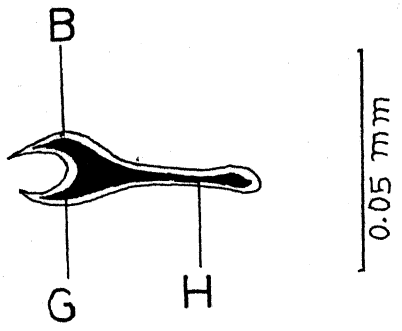



Fig 2

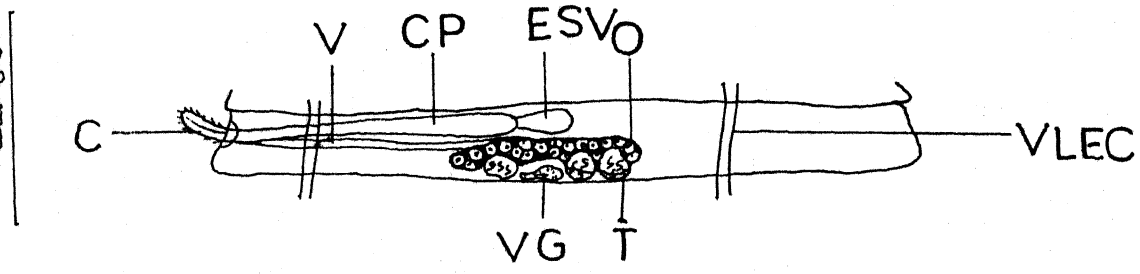



Fig 3

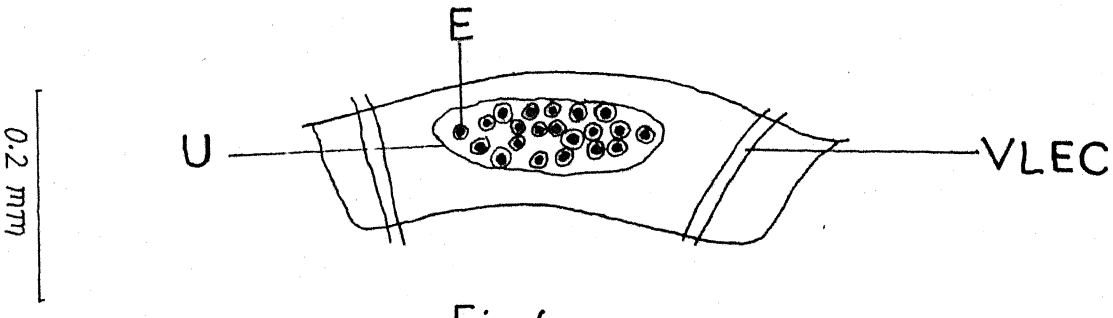



Fig 4

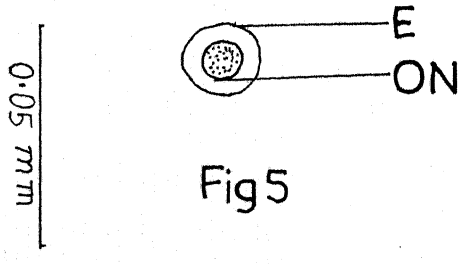



Fig5

Family : Hymenolepididae Railliet *et* Henry, 1909

Subfamily : Hymenolepidinae Perrier, 1897

Genus : *Variolepis* Spasskii *et* Spasskaja, 1954

Species : *Variolepis podicepsi* n. sp.

(Fig 1-5 PP 188 )

Three, out of nine little grebs, *Podiceps ruficollis* (Pallas) examined at Jhansi, was found infected with twenty eight cestodes of the present form. Morphological studies of the cestodes revealed them to belong to the genus *variolepis* Spasskii *et* Spasskaja, 1954 of the subfamily Hymenolepidinae Perrier, 1897, family Hymenolepididae Railliet *et* Henry, 1909.

Cestodes measure 75-105 cm in length and 0.528 in maximum breadth as seen in gravid proglottids. Proglottids broader than long and craspedote.

Scolex measures 0.144-0.252x0.072-0.228 (0.183x0.150). Suckers four, oval to round, unarmed measure 0.042-0.078x0.042-0.072 (0.060x0.057). Rostellum armed measures 0.066-0.204x0.064-0.090 (0.135x0.082). Rostellar hooks ten in number, arranged in a single row measure 0.0576-0.0640 (0.068) in length. Handle, 0.0320-0.0401 (0.0361); guard, 0.0164-0.0256 (0.0240) and blade, 0.0206-0.0304 (0.0280) in length.

Neck measures 0.354–0.390x0.132–0.156 (0.372x0.144). Immature proglottids measure 0.018–0.030x0.180–0.348 (0.024x0.264); mature proglottids measure 0.048–0.072x0.348–0.444 (0.060x0.396) and gravid proglottids measure 0.072–0.096x0.432–0.528 (0.084–0.480).

Testes 3 in number 1 poral 2 aporal, oval to round measures 0.012–0.015x0.012–0.021 (0.014x0.018). Cirrus pouch elongated measures 0.216–0.294x0.012–0.030 (0.255x0.021) and well past the poral ventral longitudinal excretory canal reaches upto the 2/3rd of the proglottids width. Cirrus armed measures 0.030–0.078x0.006–0.012 (0.054x0.009).Internal and external seminal vesicles absent.

Female genitalia slightly aporal. Ovary bilobed measures 0.006–0.012x0.042–0.072 (0.009x0.057).Vitelline gland postovarian,compact measures 0.006–0.009x0.018–0.024 (0.008x0.021). Vagina posterior to cirrus pouch measures 0.006–0.015(0.011)in diameter. Receptaculum seminis measures 0.018–0.036x0.006–0.012 (0.027x0.009).

Genital atrium measures 0.006–0.018 (0.012) wide and 0.006–0.030 (0.018) in deep. Genital openings unilateral and located in the anterior half of the proglottid margin.

Uterus sac like measures 0.036–0.072x0.354–0.450

(0.054x0.402),extend beyond the limits of ventral longitudinal excretory canals. Eggs measure 0.0080–0.0160x0.0080–0.0193 (0.0120x0.0136). Onchospheres measure 0.0064–0.0112x0.0080–0.0128(0.0088x0.0101).

Ventral longitudinal excretory canals measure 0.006–0.018 (0.012) in diameater.

## Discussion

The present form comes closer to *Variolepis hughesi* (Webster, 1947) Yamaguti, 1959; *Variolepis passerus* Tewari,1987 ( unpublished); *Variolepis planestici* (Mayhew, 1925) Spasskii *et* Spasskaja, 1954; *Variolepis tristis* Tewari,1987 (unpublished thesis). *Variolepis variabilles* (Mayhew,1925) Yamaguti, 1959 and *Variolepis victoriata* (Inamder,1934) Spasskii *et* Spasskaja,1954.

From *V.hughesi* (Webster,1947) Yamaguti, 1959 the present form differs in having longer worms, larger rostellar hooks, smaller testes , narrower cirrus pouch, different shape of smaller ovary, smaller vitelline gland, narrower eggs and narrower onchospheres. From *V. passerus* Tewari, 1987 it differs in having larger worms, larger rostellar hooks, smaller testes, narrower cirrus pouch, bilobed narrower ovary, compact smaller vitelline gland, smaller eggs and smaller onchospheres. From *V.planestici* (Mayhew, 1925) Spasskii *et* Spasskaja, 1954 it differs in having larger

worms longer rostellar hooks, narrower testes, different shape of ovary, narrower eggs and narrower onchospheres. From *V. tristis* Tewari, 1987 it differs in having larger worms, wider rostellum, greater number of larger rostellar hooks, narrower testes, different extension of smaller cirrus pouch, different shape of narrower ovary, smaller vitelline gland, narrower eggs and narrower onchospheres. From *V. variabillis* (Mayhew, 1925 ) Yamaguti, 1959 it differs in having smaller worms, wider rostellum, larger rostellar hooks, different extension of cirrus pouch, different shape of ovary. From *V. victoriate* (Inamdar, 1934)Spasskii *et* Spasskaja, 1954 it differs in having narrower worms, larger rostellar hooks, wider testes and varied extension of larger cirrus pouch, different shape of narrower ovary, smaller eggs and narrower onchospheres.

In the light of the above discussion it is proposed to accommodate the present form as a new species, *Variolepis podicepsi* n.sp.

| | | |
|---|---|---|
| Host | : | *Podiceps ruficollis* (Pallas) |
| Habitat | : | Intestine |
| Locality | : | Jhansi |
| Holotype | : | Department of Zoology, Bipin Bihari (P.G.) College, Jhansi. |

TABLE 19

Comparison of the characters of the species closer to Veriolepis podicepsi n. sp.

| | V.hughesi (Webster, 1947 yamaguti, 1959 | V. passerus Tewari, 1987 | V.plane stici (Mayhew 1925) spasskii et spasskaja, 1954 | V.trists Tewari, 1987 | V.variabi-llis (May-hew, 1925) yamaguti, 1959 | V.victoriata (Inamdar 1934) Spass kii et spa-sskaja, 1954 | V.podicepsi n. sp. |
|---|---|---|---|---|---|---|---|
| Size | 37-50x1.0 | 10-15x1.1 | 10-35x 0.5-1.5 | 21-34x1.4 | 3.0x1.0 | 60x1.35 | 75-105x0.52 |
| Scolex dia. | 0.144-0.173 | 0.23-0.25 | 0.2 | 0.154-0.198 | 0.2 | 0.2 | 0.072-0.228 |
| Suckers dia. | 0.064-0.082 | 0.08-0.09 | - | 0.042-0.076 | 0.08 | 0.07 | 0.042-0.072 |
| Rostellum | 0.04-0.054 | 0.05-0.07 x 0.04-0.06 | - | 0.07-0.084 x 0.03-0.04 | 0.02 | 0.212x0.087 | 0.066-0.204x 0.064-0.090 |
| Rostellar hooks No | 10 | 10 | 10 | 8 | 10 | 10 | 10 |
| Length | 0.014-0.015 | 0.014-0.016 taenia like | 0.014 | 0.017-0.02 cheli form | 0.02-0.022 | 0.0228-0.03 | 0.057-0.064 fraternoid |
| Testes dia. | 0.124-0.164 | 0.12-0.17 aporal testes reaches upto VLEC | 0.06-0.08 | 0.028-0.098x 0.056-0.112 poral and aporal testes reaches near VLEC | - | 0.014 | 0.012-0.021 aporal testes crosses the VLEC |
| Cirrus pouch | 0.158-0.180 x 0.045-0.053 | 0.17-0.24 x 0.04-0.07 | - | 0.18-0.2 x 0.03-0.04 | - | 0.21x0.043 | 0.216-0.294 x 0.012-0.03 |
| Extension | 53 | Crossing the VLEC | | upto or cross the VLEC | 1/3rd width of proglottid | upto mid line of pro glottid | upto 2/3rd of the proglottid width i.e., cross the VLEC |
| Ovary width | 0.278-0.4 bilobed or trilobed | 0.2-0.22 lobulated fan shaped | - irregu-lar an shaped | 0.098-0.294 bilobed each lobe further labulated | - lobed | 0.17 | 0.006-0.012 x 0.042-0.072 bilobed |

| | V.hughesi (Webster, 1947 yamaguti, 1959 | V. passerus Tewari, 1987 | V.planestici (Mayhew 1925) spasskii et spasskaja, 1954 | V.trists Tewari, 1987 | V.variabillis (Mayhew, 1925) yamaguti, 1959 | V.victoriata (Inamdar 1934) Spasskii et spasskaja, 1954 | V.podicepsi n. sp. |
|---|---|---|---|---|---|---|---|
| vitelline gland | 0.078-0.102 | 0.05-0.08 x 0.08-0.10 variously lobed | - | 0.028-0.056 x 0.042-0.112 variously lobed | - | - | 0.006-0.009 x 0.018-0.024 compact |
| Receptaculum seminis | - | present | - | absent | - | - | present |
| Egg dia. | 0.047-0.05 | 0.04-0.07 | 0.035 x 0.02-0.049 0.047 | | - | 0.048x0.045 | 0.0080-0.0160 x 0.0080-0.0193 |
| Onchospheres | 0.031-0.033 x 0.02-0.04 0.026-0.028 | | 0.032 x 0.014-0.028 0.024 | | - | 0.019 | 0.0080-0.0128 |

TABLE- 20

Comparison of the characters of the *Variolepis lalin.sp.* and
*Variolepis podicepsin.sp.*

| | V.lalin.sp. | V.podicepsin.sp. |
|---|---|---|
| Size | 45-55x0.480 | 75-105x0.52 |
| Scolex dia. | 0.192-0.210 | 0.072-0.228 |
| Sucker dia. | 0.042-0.048 | 0.042-0.072 |
| Rostellum | 0.108-0.126x0.072<br>-0.090 | 0.066-0.204x0.084<br>-0.091 |
| Rostellar<br>Hooks | | |
| No. | 14 | 10 |
| Length | 0.048-0.060<br>'Y' Shape | 0.057-0.144<br>fraternoid |
| Testes dia. | 0.024-0.031<br>in transverse row | 0.012-0.021<br>aporal testes crosses<br>the VLEC |
| Cirrus pouch<br>Size | 0.198-0.252x0.012<br>-0.028 | 0.216-0.294x0.012<br>-0.030 |
| extension | never reaches upto<br>middle width of the<br>proglottid | upto 2/3rd of the<br>proglottid width ie.<br>crosses the VLEC |
| Ovary | 0.012-0.038x0.132<br>-0.181<br>transversely elong-<br>ated | 0.006-0.012x0.042-<br>0.072<br>bilobed |

| | V.lalin.sp. | V.sodiceaesin.sp. |
|---|---|---|
| Vitelline gland | 0.006–0.012×0.024<br>0.036 | 0.006–0.009×0.018<br>0.024 |
| Receptaculum seminis | absent | present |
| Egg dia. | 0.015–0.021×0.013<br>–0.022 | 0.0060–0.0160×0.0080<br>–0.0193 |
| Onchospheres | 0.006–0.013×0.007<br>–0.012 | 0.0080–0.0128 |

*Variolepis podicepsi* n.sp

| | |
|---|---|
| Fig-1 | Scolex (10x10) |
| Fig-2 | Rostellar hook (10x45) |
| Fig-3 | Mature proglottid (10x10) |
| Fig-4 | Gravid proglottid (10x10) |
| Fig-5 | Egg (10x45) |

Abbreviations - B,blade ; C,cirrus ;CP, cirrus pouch; E,egg ;G, guard; GA, genital atrium; H, handle; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook;RS, receptaculum seminis; S,sucker; SC, scolex; T,testes; U,uterus; V,vagina; VG,Vitelline gland; VLEC, Ventral longitudinal excretory canal.

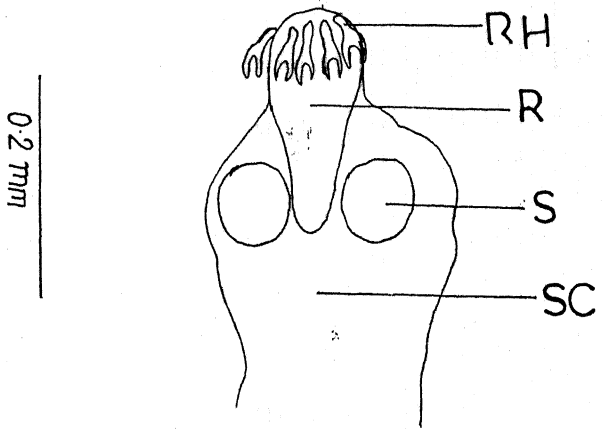



Fig 1

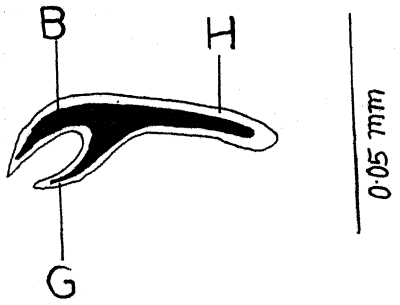



Fig 2

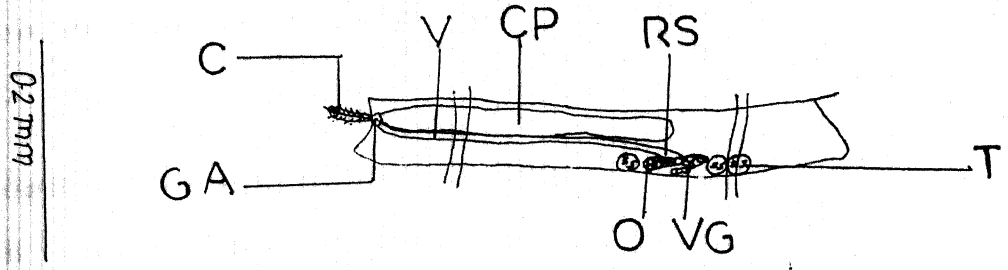



Fig 3

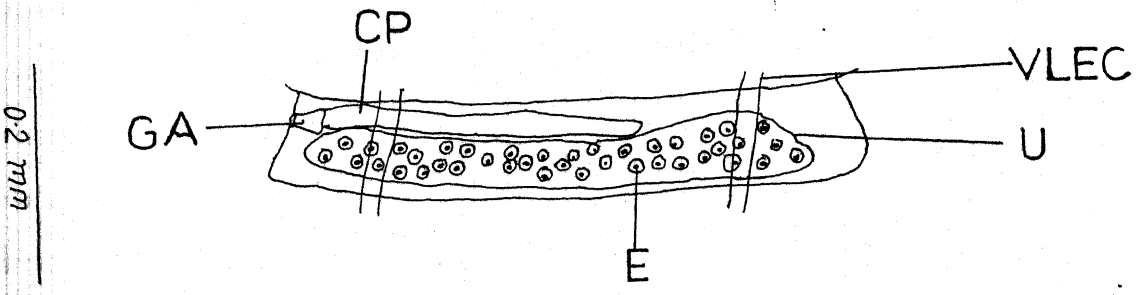



Fig 4

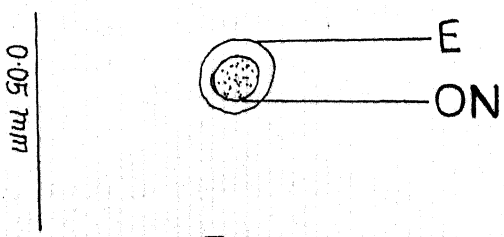



Fig 5

*Variolepis podicepsi* n.sp.

Family : Amabiliidae Ransom, 1909

Genus : *Unischistotaenia* n.g.

Species : *Unischistotaenia pannaensis* n.g. n.sp.

(Fig 1-5, PP- 198 )

One of six little grebs, *Podiceps ruficollis* (Pallas) examined at Panna (M.P.) harboured three cestodes in its intestine. The morphological studies of the cestode revealed them to belong to the new genus *Unischistotaenia* n.g. of the family Amabiliidae Ransom. 1909.

Amended diagnosis of the family : *Amabiliidae* Small forms with an armed rostellum. Proglottids with lateral marginal out growth upon. which the male apertures may or may not be open. Genitalia single or partly double; single genital pores unilateral or alternate regularly or irregularly alternating. Vaginal aperture communicating with excretory vessel or lacking but some times replaced in function by an accessory canal which opens to the outside. Eggs with a thin transparent shell. Parasites of birds.

*Unischistotaenia* n.g.

Generic diagnosis.

Small sized worm, rostellum armed with a single crown of 12 rostellar hooks, handle long, blade and

guard approximately equal. Suckers unarmed. Proglottids extremely craspedote. Protandrous. Single set of genitalia per proglottids. Testes 34-55 in number, oval to round, arranged in two groups on each side of female genitalia. Internal seminal vesicle present, unarmed cirrus. Male genital pore unilateral. Ovary bilobed and further lobulated. Vitelline gland transverse tube like. Vagina absent. Receptaculum seminis opens at the anteromid width of the next proglottids provided by an accessory canal which opens on both flat surfaces Uterus sac like which occupies the whole gravid proglottid. Parasites of aquatic birds.

*Unischistotaenia pannaensis* n.g., n. sp.

Cestodes measures 35-39 cm in length and 3.061 in maximum width as seen in the gravid proglottids. Proglottids broader than long and craspedote.

Scolex measures 0.589-0.604x0.989-0.1048 (0.597x1.014). Suckers four, oval to round measure 0.272-0.288x0.264-0.299 (0.270x0.276). Rostellum broader than long measures 0.210-0.280x0.498-0.566 (0.245x0.532). Rostellum provided with 12 rostellar hooks. Rostellar hooks measure 0.121-0.159 (0.140) in length. Each rostellar hook contains a handle, 0.084-0.118 (0.098); a blade 0.034-0.041 (0.038) and a guard, 0.034-0.048 (0.041) in length.

Neck very short measures 0.144-0.165x0.722-0.786 (0.151x0.76). Immature proglottids measure 0.024-0.085x0.738-1.785 (0.063x1.265); mature proglottids measure 0.085-0.680x1.531-3.061 (0.382x2.295) and gravid proglottids measure 0.544-0.804x2.211-3.061 (0.695x2.864).

Testes protandrous 34-55 in number oval to round, arranged in two groups on each side of female genitalia. Each poral and aporal group contains 16-20 (18) and 18-35 (27) testes respectively. Testes measures 0.021-0.052x0.021-0.052 (0.037x0.037). Cirrus pouch club shape measure 0.098-0.255x0.017-0.119 (0.117x0.068) never reaches upto the ventral longitudinal excretory canal. Internal seminal vesicles measure 0.048-0.168x0.017-0.060 (0.108x0.039). External seminal vesicle absent.

Female genitalia median. Ovary bilobed and each lobe is further lobulated measureing 0.025-0.187x0.085-0.340 (0.106x0.212), attains maturity after the disappearance of male organs. Vitelline gland postovarian measures 0.017-0.085x0.051-0.323 (0.051x0.187). Vagina absent. Receptaculum seminis measures 0.034-0.204x0.051-0.187 (0.119x0.119), located at the anteriormid width of proglottid, provided by accessory canal which opens anterior to cirrus pouch.

Accessory canal measures 0.012–0.036 (0.024) in diameter. Medial duct connects the receptaculum seminis of each proglottids which measures 0.021–0.071 (0.051) in diameter.

Genital atrium measures 0.022–0.042 (0.032) deep and 0.021–0.066 (0.039) wide. Male genital pores unilateral
located in the anterior half of the proglottid margin.

Uterus an irregular sac like structure measures 0.204–0.816x0.255–2.551 (0.510x1.401) extend beyond the limits of ventral longitudinal excretory canals. Eggs measure 0.012–0.024x0.012–0.024 (0.018x0.018). Onchospheres measure 0.005–0.012x0.005–0.012 (0.009x0.009).

Ventral longitudinal excretory canals measure 0.012–0.048 (0.031) in diameter.

## Discussion

Schmidt, 1986 has included five genera in the family Amabiliidae Ransom, 1909 while the present form comes closer to *Diporotaenia* Spaskaja, Spasskii *et* Borgarenko 1971; *Amabilia* Diamare, 1893; *Tatria* Kowalewski, 1904; *Schistotaenia* Cohn, 1900 and *Pseudoschistotaenia* Fotedar *et* Chisti, 1976.

The present form differs from *Diporotaenia* Spasskaja, Spasskii *et* Borgarenko, 1971 in having unilateral genital pores, testes in two groups, median bilobed ovary, presence of internal seminal vesicle, absence of external seminal vesicle and irregular sac like uterus. From *Amabilia* Diamare, 1893 in having unilateral genital pores, unarmed cirrus, bilobed ovary and an irregular sac like uterus. From *Tatria* kowalewski, 1904 in having unilateral genital pores, cirrus pouch never reaches the ventral longitudinal excretory canal, unarmed cirrus, different disposition of testes and absence of external seminal vesicle. From *Schistotaenia* cohm 1900 in having unilateral genital pores, cirrus pouch never reaches upto the ventral longitudinal excretory canal, unarmed cirrus, testes in two groups, bilobed ovary, presence of internal seminal vesicle and absence of external seminal vesicle and uterus irregular sac like. From *Pseudoschistotaenia* Fotedar *et* Chisti, 1976 in having unilateral genital pores, cirrus pouch never reaches upto the ventral longitudinal excretory canal, testes in two groups, presence of internal seminal vesicle, absence of external seminal vesicle and irregular sac like uterus.

In the light of above discussion it is proposed to accommodate the present form as a new genus and a new species, *Unischistotaenia pannaensis* n.g., n.sp.

Host : *Podiceps ruficollis* (P)

Habitat : Intestine

Locality : Panna (M.P.)

Holotype : Department of Zoology

Bipin Bihari (p.G.) College, Jhansi

Table 21

Comparison of the new genus *Unischistotaenia* n.g. from various genera

| | *Diporotaenia Spasskaja, Spasskii et Borgarenko, 1971* | *Amabilia Diamare, 1893* | *Tatria Kowalewaski, 1904* | *Schistotaenia Cohn, 1900* | *Pseudoschistotaenia, Fotedar et Chisti, 1976* | *Unischistotaenia n.g.* |
|---|---|---|---|---|---|---|
| Genital pores | regularly alternating | Bilateral | regularly alternating | irregularly alternating | regularly alternating | Unlateral |
| Cirrus Pouch | - | not reaching VLEN | crosses the both VLEC | Crosses the VLEC | Crosses the VLEC | never reaches the VLEC |
| Cirrus | Unarmed | Armed | armed | armed | unarmed | unarmed |
| Testes | in single row | two submedian field | few post ovarian | single field | numerous surrounding ovary | two groups |
| Ovary | slightly aporal, with few lobes | dentritic median | bilobed median | lobated but not dentrictid | bilobed median | bilobed and further tabulated median. |
| IVS | absent | present | present | absent | absent | present |
| EVS | present | absent | present | present | present | absent |
| Uterus | transverse lobated sac | net work of tube like | ? | transverse sac | lobated | an irregular sac like |

## KEY TO THE VARIOUS GENERA IN AMABILIIDAE

1a. Rostellum much enlarged, fimbriated, unarmed ....*Diporotaenia*

1b. Rostellum otherwise .....2

2a. Male organs doubled in each proglottid, female organs single, ovary & vitellarium dendritic .....*Amabilia*

2b. Male organs single per proglottid, female organs not dendritic .....3

3a. Accessory canal opening from seminal receptacle on one surface or not at all. Male pores regularly alternate. Testes few .....*Tatria*

3b. Accessory canals opening from seminal receptacle on both flat surface Testes numerous .....4

4a. Genital pores alternating irregularly, seminal receptacle not continuous from one proglottid to another .....*Schistotaenia*

4b. Genital pores alternating regularly, seminal receptacle continous from one proglottid to another .....*Pseudoschistotaenia*

4c. Genital pores unilateral, semina receptacle continuous from one proglottid to another .....*Unischistotaenia* n.g.

*Unischistotaenia pannaensis* n.g., n.sp.

Fig 1 Scolex (5x10)

Fig 2 Rostellar hook (10x10)

Fig 3 Mature proglottid (5x10)

Fig 4 Gravid proglottid (5x10)

Fig 5 Egg (10x45)

Abbreviations :- AC, accessory canal; CP, cirrus pouch; E, egg; G, guard; GA, genital atrium; H, handle; IVS, internal seminal vesicle; MD, medial duct; O, ovary; ON, onchospheres; R,rostellum; RH, rostellar hook; RS, receptaculum seminis; S, sucker; SC, scolex; T, testes; U, uterus; VG, vitelline gland; VLEC, ventral longitudinal excretory canal.

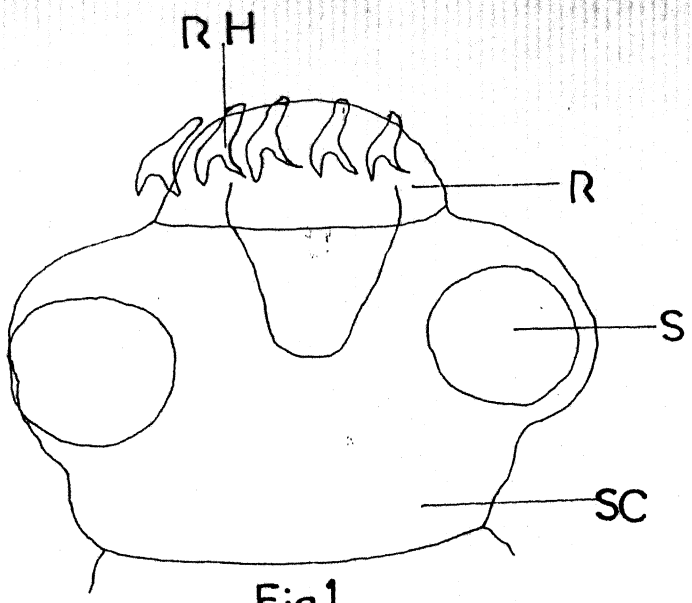



Fig 1

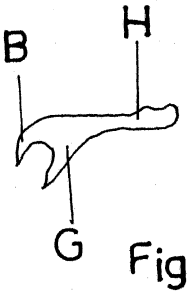



Fig 2


0.05 mm

Fig 5

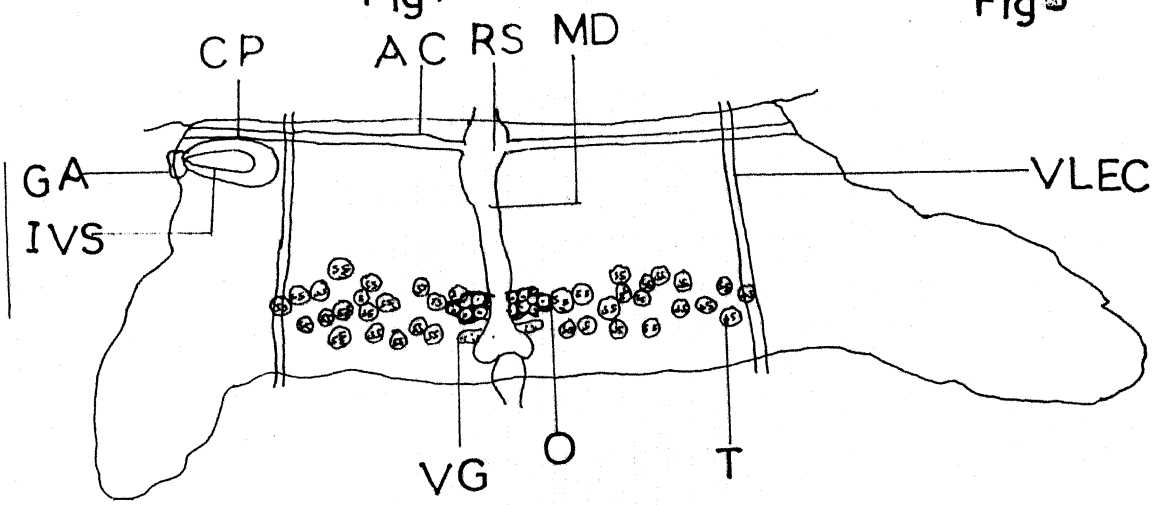
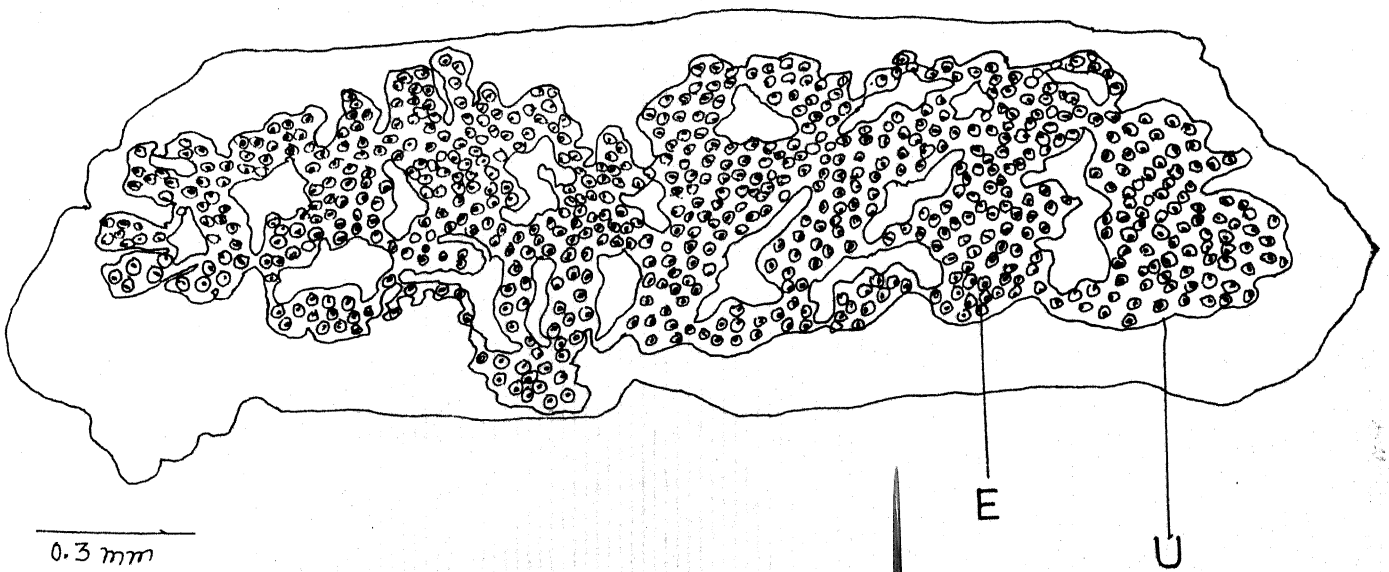



Fig 3




0.3 mm

Fig 4

Order : Cyclophyllidea Ben. in Braun ,1900

Family : Diploposthidae Poche, 1926

Genus : *Podiposthe* n.g.

Species : *Podiposthe hridyaii* n.g., n.sp.

(Fig 1-5, PP 208 )

Out of eight little grebs, *Podiceps ruficollis* (Pallas) examined at Baruasagar, District Jhansi (U.P.) one was found infected with single cestode in its intestine. The morphological studies of the cestode revealed them to belong to the geuns *Podiposthe* n.g. of the family Diploposthidae Poche, 1926.

*Amended diagnosis of the family Diploposthidae* : Testes numerous in single field, male genitalia double, female genitalia single. Vagina present with vaginal aperture. Receptaculum seminis absent. Uterus sac like.

*Podiposthe* n.g.

*Generic diagnosis* : Proglottids wider than long, craspedote or acraspedote. Male with two sets of reproductive organs per proglottid. Cirrus pouch crosses the poral ventral longitudinal excretory canals. Internal seminal vesicle present, external seminal vesicle absent. Cirrus armed. Testes numerous in one median group. Female genitalia median single in each proglottid. Ovary on poral side. Vitellaria

compact, postovarian, vagina unilateral Receptaculum seminis absent. Uterus sac like. Parasites of Podicipediformes.

*Podiposthe hridyaii* n.g., n.sp.

Cestodes measures 14.1 cm in length and 3.741 in maximum breadth as seen in the mature proglottids. Strobila consists of numerous proglottids. All proglottids broader than long, and some craspetode; and other acraspedote in immature proglottids.

Scolex measures 0.408x0.624 (0.515). Suckers four, oval, unarmed measure 0.162-0.175x0.098-0.121 (0.169x0.111). Rostellum armed, longer than broad measures 0.384x0.175. Rostellum bears 14 rostellar hooks arranged in single row measure 0.074-0.092 (0.072) in length. Hook contains handle, 0.0320-0.0352 (0.0336); blade 0.0352-0.0401 (0.0376) and guard, 0.0032-0.0048 (0.0040) in length.

Neck absent. Immature proglottids measure 0.017-0.051x0.595-0.850 (0.034x0.043); mature proglottids measure 0.051-1.02x0.918-3.74 (0.535x2.329) and gravid proglottids measure 0.765-1.530x1.320-3.570 (1.147x2.445).

Male genitalia double show protrandrous condition. Testes number 70-100 (85), oval to round, distributed in one

group measures 0.012–0.036x0.012–0.036 (0.024x0.024), never crosses the ventral longitudinal excretory canals. Cirrus pouch club shaped, crosses the Ventral longitudinal excretory canal measures 0.170–1.105x0.017–0.289 (0.637x0.153). Cirrus armed measures 0.051–0.595x0.012–0.204 (0.323x0.108). Internal seminal vesicles measure 0.051–0.255x0.034–0.204 (0.153x0.119). External seminal vesicles absent.

Female genitalia single. Ovary transverse tube like measures 0.034–0.068x0.051–0.289 (0.051x0.170). Vitelline gland compact, postovarian measures 0.012–0.024x0.024–0.048 (0.018x0.036). Vagina measures 0.011–0.024 (0.017) in diameter. Receptaculum seminis absent.

Genital atrium measures 0.024–0.180 (0.102) in width and 0.036–0.120 (0.078) in depth. Genital pores bilateral, located in the anterior or slightly middle half of the proglottid width.

Uterus sac like measures 1.020–1.360x0.624–3.060 (1.190x1.842), never extend beyond the limits of the ventral longitudinal excretory canals. Eggs measure 0.012–0.036x0.012–0.036 (0.024x0.024). Onchospheres measures 0.0064–0.0128x0.0062–0.0126 (0.0112x0.0110).

Ventral longitudinal excretory canals measures 0.012–0.036 (0.024) in diameter.

*Discussion*

Yamaguti, 1959 has included only three genera viz. *Diplophallus* Fuhrmann, 1900; *Diploposthe* Jacobi, 1896 and *Jarduqia* Southwell *et* Henry, 1929 in the family Diploposthidae Poche, 1926.

The present new genus differs from Diplophallus Fuhrmann, 1900 in having testes in single field, different extension of cirrus pouch, armed cirrus, absence of vas deferens, different shape of ovary, simple vagina and sac like uterus with few out growths. From *Diploposthe* Jacobi, 1896 in having greater unmber of rostellar hooks, greater number of differently disposed testes, absence of external seminal vesicle, larger cirrus pouch, shape of ovary and uterus never crosses the ventral longitudinal excretory canals. From *Jarduqia* Southwell *et* Helmy 1929. It differs in having greater number of rostellar hooks, greater number of testes, absence of external seminal vesicle, different shape of ovary different shape and disposition of vitelline gland, single vagina and uterus never crosses the ventral longitudinal excretory canals.

In the light of above discussion the present form is accommodated as a new genus, *Podiposthe* n.g. and a new species *Podiposthe hridyalii* n.g., n.sp. The species is named in the honour of an eminent Indian

parasitologist, Dr H. N. Tripathi, I.D.P.L., Hyderabad.

Host : *Podiceps ruficollis* (Pallas)

Habitat : Intestine

Locality : Baruasagar, Jhansi

Holotype : Department of Zoology
Bipin Bihari (P.G.) College, Jhansi

Table 22

Comparison of the new genus Podiposthen.g. from various genera

| | Diplophallus Fuhrmann, 1900 | Diploposthe Jacobi. 1896 | Jardugia Southwell and Hilmy, 1929 | Podiposthe n.g. |
|---|---|---|---|---|
| Postellar hooks | - | 10 | 10 | 14 |
| Testes | Numerous, divided into two lateral groups each group forming a bunch around vas deferens | 3-7, postero dorsal to ovary | 2-6, dorsal medial to excretory stems. | 75-100 in single group between the cirrus pouch |
| Internal seminal vesicle | Present | present, club-shaped | present | present, Bean shaped |
| External seminal vesicle | - | present | present | absent |
| Cirrus pouch | muscular, small | muscullar small | elongated | elongated |
| Cirrus spines | absent | cirrus large armed with double rooted hooks. | prostatic cells and spinose cirrus | Cirrus armed |
| Vas deferens | present | - | - | absent |

| | Diplophallus Fuhrmann, 1900 | Diploposthe Jacobi, 1896 | Jarduqia Southwell and Hilmy, 1929 | Podiposthe n.g. |
|---|---|---|---|---|
| Ovary | Ventral, median large two winged | Ovary two winged | median multi-lobulate, occupying middle third of proglottids | small, transverse tube like median |
| Vitelline gland | small, posterodorsal | Compact, both median | daeply lobed, median, poster odorsal to ovary, | small, postovarian, |
| Vagina | atrophied | opening into genital atrium ventral to cirrus pouch. | Vaginae double each opening into genital atrium ventral to cirrus pouch | Vagina single, open, into genital atrum posterior to cirrus pouch |
| Uterus | first a transverse tube, later on sac like with numerous out growths | Uterus a transverse tube extending whole width of medulla crosses the ventral longitudinal excretory canals | At first a transverse tube, extending laterally beyond excretory stem. | Sac like within the limits of the ventral longitudinal excretory canals, never tube like |

## KEY OF THE VARIOUS GENERA OF THE FAMILY DIPLOPOSTHIDAE POCHE, 1926

| | | |
|---|---|---|
| 1a. | Vaginal aperture absent | ....2 |
| 1b. | Vaginal aperture present | ....3 |
| 2a. | Male and female genitalia single | .....*Acoleus* |
| 2b. | Male genitalia double, female genitalia single | ....*Diplophallus* |
| 3a. | Testes arranged in a single median field, few in number | ....*Diploposthe* |
| 3b. | Testes arranged in two submedian fields | ....*Jardupia* |
| 3c. | Testes arranged in a single field, numberous in number | ....*Podiposthe* n.g. |

*Podiposthe hridyai* n.g., n. sp.

Fig 1 Scolex (5x10)

Fig 2 Rostellar hook (10x45)

Fig 3 Mature proglottid (5x10)

Fig 4 Gravid proglottid (5x10)

Fig 5 Egg (10x45)

Abbreviations :- B, blade; C, cirrus; CP, cirrus pouch; E, egg; G, guard; GA, genital atrium; H, handle; IVS, internal seminal vesicle; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook; S, sucker; SC, scolex; T, testes; U, uterus; V, vagina; VG, vitelline gland; VLEC, ventral longitudinal excretory canal.

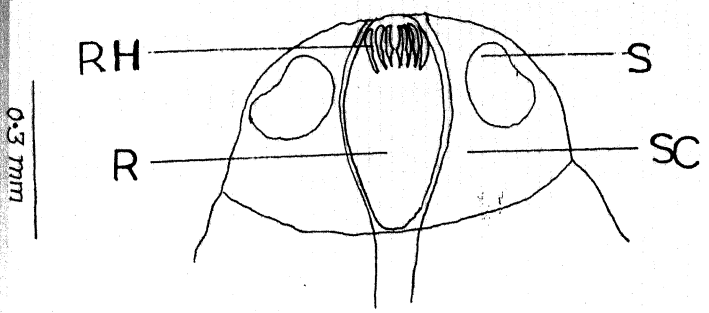



Fig1

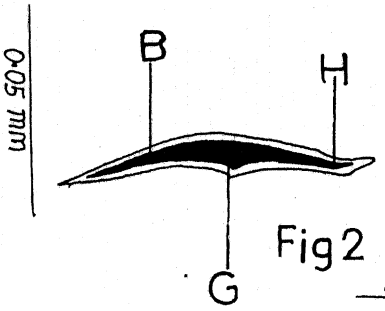



Fig 2

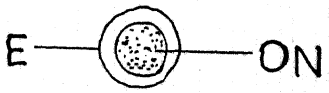



Fig 5

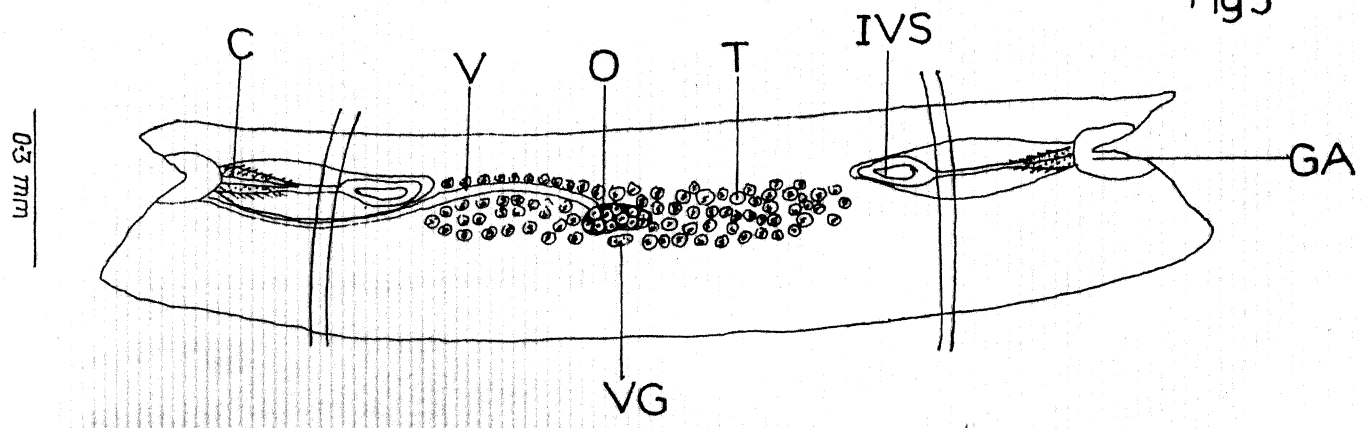



Fig 3

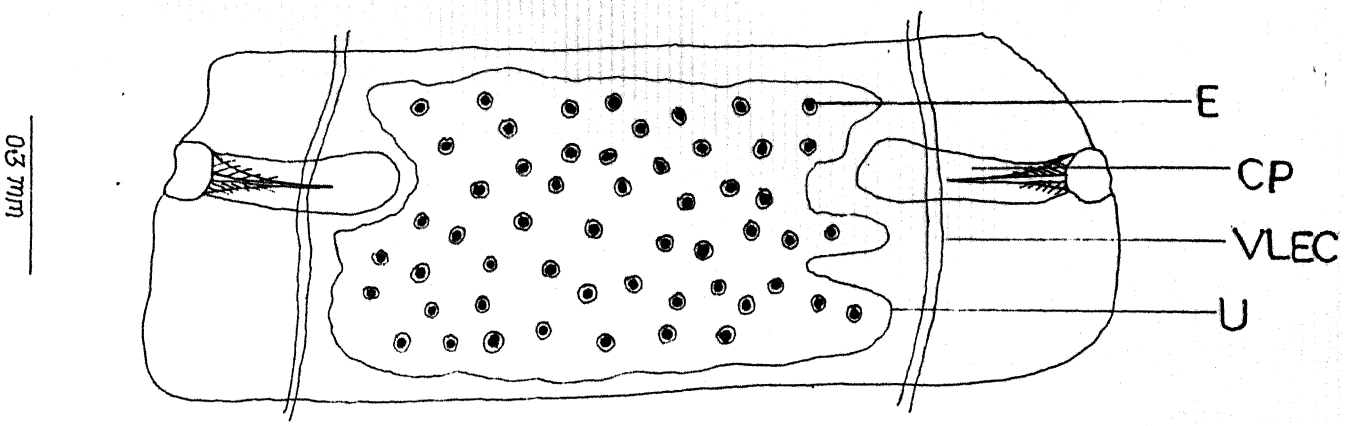



Fig 4

*Podiposthe hridyaii* n.g., n.sp.

Family : Dioecocestidae Southwell, 1930

Subfamily : Dioecocestinae Fuhrmann, 1930

Genus : *Jhansizia* Rani, Daisy : Tewari and Khare,1995

Species : *Jhansizia tikamgarhensis* n. sp.

(Fig male : 1-3 PP 215 )
(Fig female : 1-4 PP 217 )

Six little grebs *Podiceps ruficollis* (Pallas) examined at Niwari, District Tikamgarh, (M.P.) two were found infected with four cestodes, one male and one female in each host. The cestodes were present in the intestines of the host. The morphological studies of the cestodes revealed them to belong to the genus *Jhansizia* Daisy, Rani, Tewari and Khare, 1995 of the subfamily Dioecocestinae Fuhrmann, 1936: family Dioecocestidae Southwell, 1930.

*Jhansizia tikamgarhensis* n. sp.

Male

Cestodes measure 172-191 cm in length and 2.891 in maximum width as seen in mature proglottids. Strobila consists of numerous proglottids. All proglottids are craspedote and broader than long.

Scolex measures 0.488-0.510x0.652-0.716 (0.401x0.534). Suckers unarmed, oval to round measure 0.084-0.156x0.060-0.144 (0.120x0.120). Rostellum unarmed longer than broad, protruded measures 0.308-0.336x0.048-0.180 (0.222x0.104). Rostellar hooks absent.

Neck absent. Immature proglottids measure 0.017–0.068x0.681–0.935 (0.0425x0.807) and mature proglottids measure 0.102–1.19x0.935–2.89 (0.646x1.912).

Male genitalia double. Testes 45–100 (75) in number, oval to round in single field measures 0.024–0.068x0.024–0.068 (0.046x0.046). reaches upto ventral longitudinal excretory canals. cirrus pouch measures 0.255–1.191x0.057–0.425 (0.722x0.235). crosses ventral longitudinal excretory canal. Armed cirrus measures 0.171–0.595x0.102–0.204 (0.382x0.153). Cirrus spines measure 0.0042–0.0105 (0.0075) in length. Internal seminal vesicle present, external seminal vesicle absent.

Genital atrium measures 0.149–0.311 (0.144) deep and 0.051–0.255 (0.153) wide. Genital openings bilateral, located in the anterior half of the proglottid margin.

Dorsal longitudinal excretory canals measure 0.017–0.051 (0.034) and ventral longitudinal excretory canals measure 0.017–0.042 (0.034) in diameter.

## Female

Cestodes measure 140–225 (185) in length and 4.931 in maximum width as seen in the gravid proglottids are broader than long and craspedote.

Scolex measures 0.456–0.540x0.801–1.008 (0.348x0.654). Suckers unarmed.. oval to round measure

0.092 - 0.192 x 0.084 - 0.228 (0.132x0.156). Rostellum unarmed, longer than broad, protruded measures 0.108-0.288x0.084-0.252 (0.198x0.168). Rostellar hooks absent.

Neck absent. Immature proglottids measure 0.051-0.057x0.935-1.191 (0.034x1.062): mature proglottids measure 0.121-0.646x0.851-5.101 (0.408x2.975) and gravid proglottids measure 0.34-0.68x4.251-4.931 (0.510x4.591).

Female genitalia single per proglottid. Ovary bilobed, slightly aporal measures 0.051-0.085x0.085-0.204 (0.068x0.144). Vitelline gland compact, postovarian measures 0.0136-0.024x0.017-0.034 (0.0153x0.0255). Vagina measures 0.0126-0.034 (0.030) in diameter, divisible into a copulatory and conducting regions. Copulatory region measures 0.024-0.072x0.108-0.180 (0.048x0.144) while conducting region measure 0.012-0.026 (0.019) in diameter. Receptaculum seminis measures 0.034-0.064x0.017-0.034 (0.0491x0.0255).

Uterus simple sac like without diverticulae measures 0.312-0.552x3.48-4.08 (0.432x3.78), extend beyond the limits of ventral longitudinal excretory canals. Eggs measures 0.015-0.036x0.018-0.036 (0.027x0.033). Onchospheres measure 0.0048-0.0130x0.0048-0.0131 (0.0089x0.0089).

Dorsal longitudinal excretory canals measure 0.017–0.051 (0.034) and ventral longitudinal excretory canals measure 0.017–0.051 (0.034) in diameter.

## Discussion

The present form comes closer to *Jhansiria jhansiensis* Rani Daisy, Tewari and Khare 1995.

The male worm differ from *Jhansiria jhansiensis* Rani Daisy; Tewari and Khare, 1995 in having narrower worms, narrower scolex, narrower suckers, smaller protruded rostellum, larger number of testes which reaches upto the ventral longitudinal excretory canals, larger cirrus pouch crosses the ventral longitudinal excretory canals, presence of internal seminal vesicle, genital atrium in the anterior region. The female worm differs in having narrower worms, wider suckers, wider protruded rostellum, smaller vitelline gland, narrower vagina, smaller receptaculum seminis, simple sac like uterus without diverticulae and smaller eggs.

In the light of above discussion the present form is proposed to accommodate as a new species *Jhansiria tikamgarhensis* n. sp.

Host : *Podiceps ruficollis* (Pallas)

Habitat : Intestine

Locality : Niwari, Tikamgarh (M.P.)

Holotype : Department of Zoology,
Bipin Bihari (P.G.) College, Jhansi

## Table 23

Comparison of characters of the species closer
to Jhansizia tikamgarhensisn. sp.

| | Jhansizia jhansiensis<br>Rani Daisy, Tewari & Khare<br>1995. | Jhansizia tikamgarhensis<br>n. sp. |
|---|---|---|
| **Male** | | |
| Size | 11.5-15.0x4.690 | 17.2-19.1x2.891 |
| Scolex | 0.434-1.2x0.56-1.0 | 0.488-0.510x0.652-0.716 |
| Suckers | 0.1-0.17x0.154-0.21 | 0.084-0.156x0.060-0.144 |
| Rostellum | 0.448-1.180x0.08-0.24<br>invaginated | 0.308-0.336x0.048-0.180<br>protruded |
| Testes | | |
| No. | 58-60 | 45-100 |
| size | 0.028-0.180 | 0.024-0.068 |
| position | Do not reach upto VLEC | reaches upto VLEC |
| Cirrus pouch | | |
| size | 0.400-1.134x0.154-0.252 | 0.255-1.191x[illegible]-0.425 |
| extension | Do not reach upto VLEC | Cross the VLEC |
| Internal seminal vesicle | absent | present |
| Genital atrium | | |
| wide | 0.09-0.42 | [illegible] |
| deep | 0.1-0.225 | 0.149-[illegible] |
| **Female** | | |
| Size | 13.2-16.0x6.776 | [illegible] |
| Scolex | 0.420-1.2x0.756-1.0 | [illegible] |
| Suckers | [illegible] | [illegible] |
| Rostellum | [illegible]<br>invaginated | [illegible]<br>protruded |
| Ovary | [illegible] | [illegible] |
| Vitelline gland | [illegible] | 0.012-0.024x0.017-0.034 |
| Vagina | [illegible] | 0.012-0.034 |
| Receptaculum seminis | 0.04-0.122x0.050-0.168 | 0.024-0.064x0.017-0.034 |
| Uterus | Sac like, lobulated | simple sac like |
| Eggs | 0.028-0.040 | 0.015-0.036 |

Table 23

Comparison of characters of the species closer to Jhansizia tikamgarhensis n. sp.

| | Jhansizia jhansiensis Rani Daisy, Tewari & Khare 1995. | Jhansizia tikamgarhensis n. sp. |
|---|---|---|
| **Male** | | |
| Size | 11.5-15.0x4.690 | 17.2-19.1x2.891 |
| Scolex | 0.434-1.2x0.56-1.0 | 0.488-0.510x0.652-0.716 |
| Suckers | 0.1-0.17x0.154-0.21 | 0.064-0.156x0.060-0.144 |
| Rostellum | 0.448-1.180x0.08-0.24 invaginated | 0.308-0.336x0.048-0.180 protruded |
| Testes No. | 58-60 | 45-100 |
| size | 0.028-0.180 | 0.024-0.068 |
| position | Do not reach upto VLEC | reaches upto VLEC |
| Cirrus pouch size | 0.400-1.134x0.154-0.252 | 0.285-1.191x0.057-0.425 |
| extension | Do not reach upto VLEC | Cross the VLEC |
| Internal seminal vesicle | absent | present |
| Genital atrium wide | 0.09-0.42 | 0.061-0.255 |
| deep | 0.1-0.225 | 0.149-0.311 |
| **Female** | | |
| Size | 13.2-16.0x6.776 | 14.0-22.5x4.931 |
| Scolex | 0.420-1.2x0.756-1.0 | 0.456-0.510x0.801-1.018 |
| Suckers | 0.110-0.25x0.140-0.20 | 0.072-0.172x0.064-0.228 |
| Rostellum | 0.610-0.710x0.140-0.210 invaginated | 0.108-0.288x0.064-0.252 protruded |
| [illegible] | [illegible] | 0.051-0.083x0.068-0.024 |
| [illegible] | [illegible] | 0.013-0.024x0.017-0.034 |
| [illegible] | [illegible] | 0.012-0.034 |
| [illegible] | [illegible] | 0.034-0.064x0.017-0.034 |
| [illegible] | [illegible] | simple sac like |
| Receptaculum seminis | 0.04-0.128x0.036-0.168 | 0.015-0.036 |
| Uterus | Sac like, tabulated | |
| Eggs | 0.03-0.042 | |

*Jhansiria tikamgarhensis* n. sp.

(Male) Fig 1 Scolex (5x10)

Fig 2 Mature proglottid (5x10)

Fig 3 cirrus with spines (5x45)

Abbreviations :- C, cirrus; CP, cirrus pouch; CS, cirrus spine; DLEC, dorsal longitudinal excretory canal; GA, genital atrium; IVS, internal seminal vesicle; R, rostellum; ROS, rostellar sac; S, suckers; SC, scolex; T, testes; VD, vas deferens; VLEC, ventral longitudinal excretory canal.

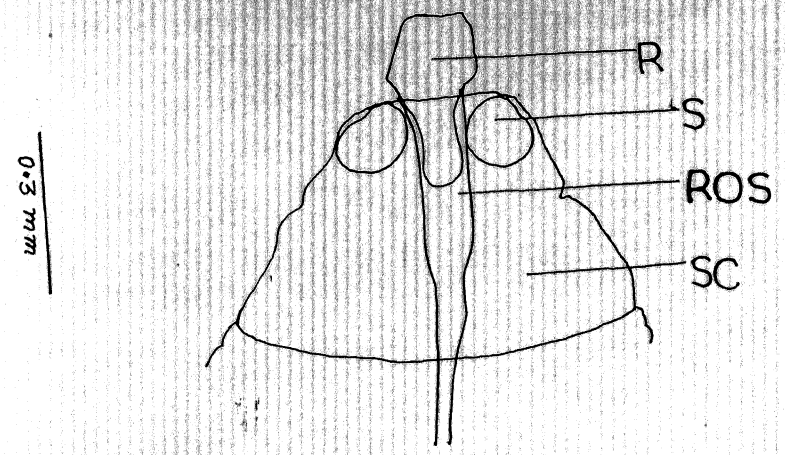



Fig 1

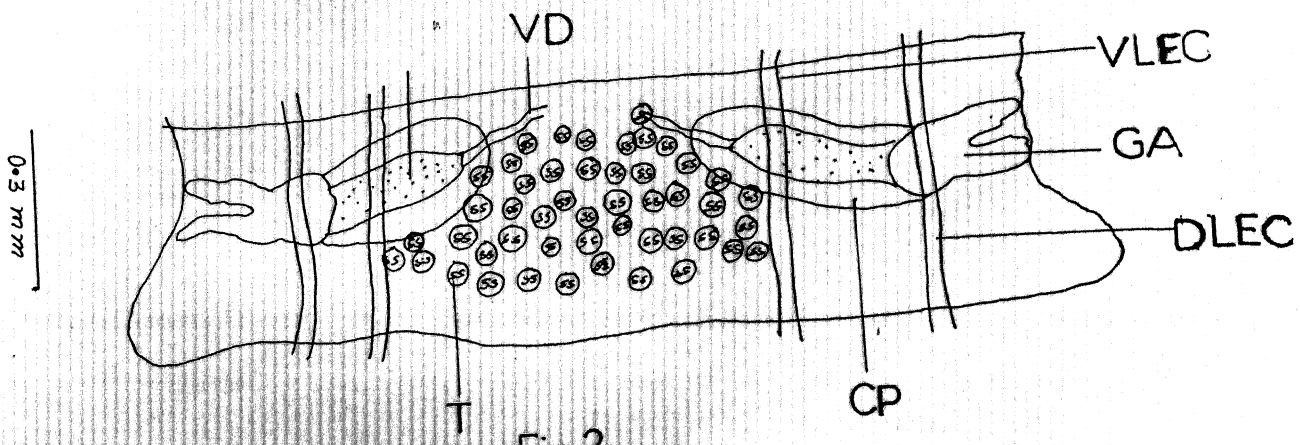



Fig 2

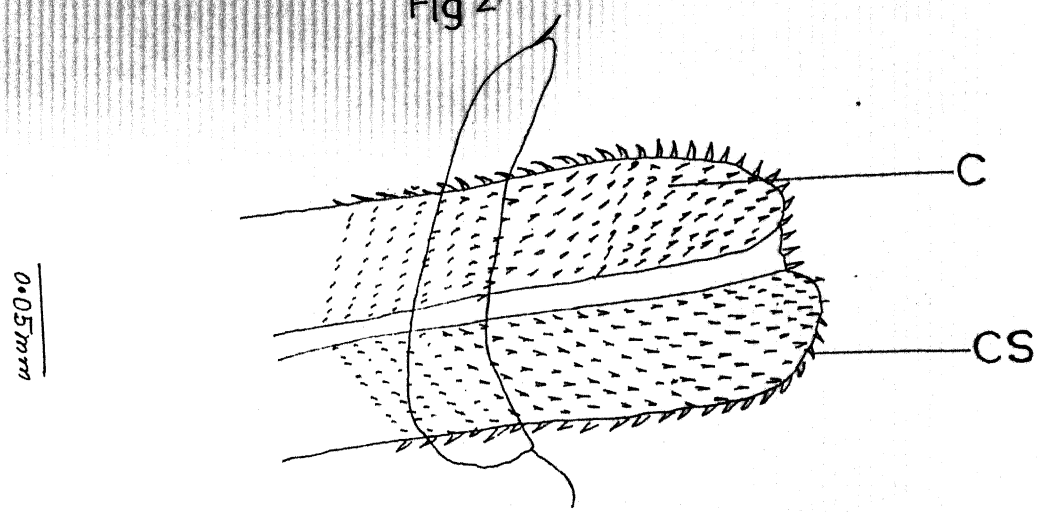



Fig 3

*Jhansizia tikamgarhensis* n.sp. (Male)

*Jhansiria tikamgarhensis* n. sp.

(Female) Fig 1 Scolex (5x10)

Fig 2 Mature proglottid (5x10)

Fig 3 cirrus with spines (5x10)

Fig 4 Egg (10x45)

Abbreviations :- COR, copulatory region; CR, conducting region; DLEC, dorsal longitudinal excretory canal; E, egg; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook; RS, receptaculum seminis; ROS, rostellar sac; S, suckers; U, uterus; VG, vitelline gland;VLEC, ventral longitudinal excretory canal.

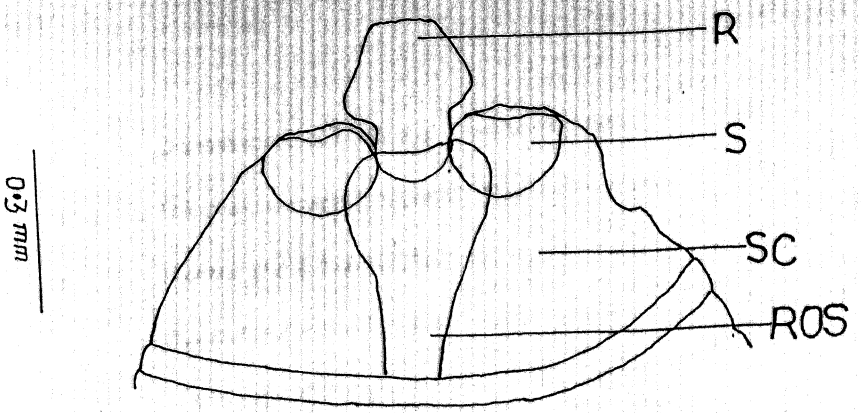



Fig1

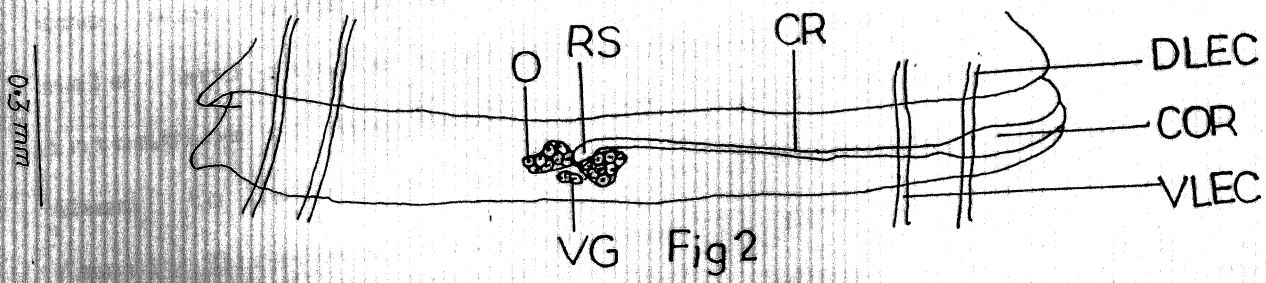



Fig 2

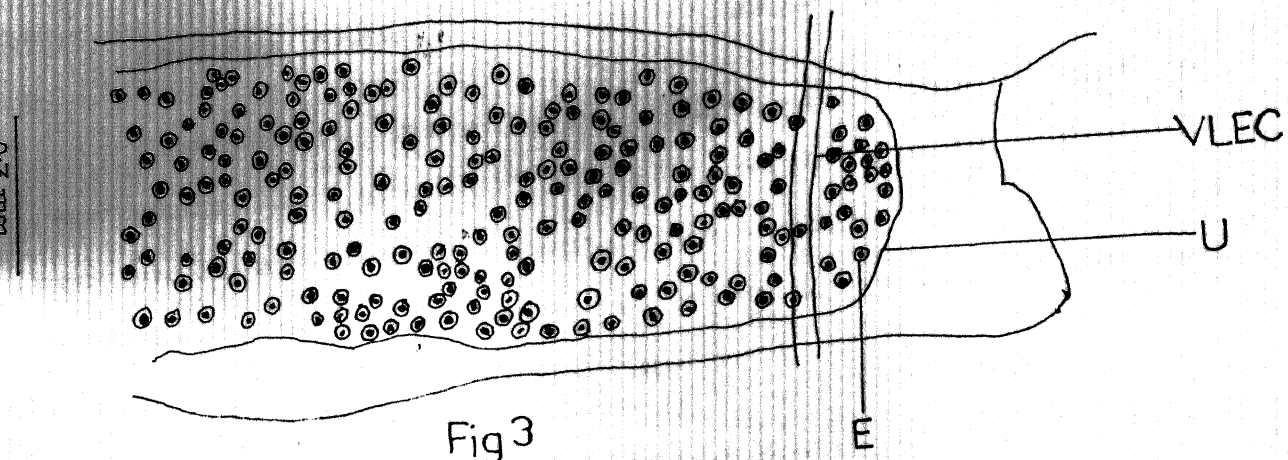



Fig 3

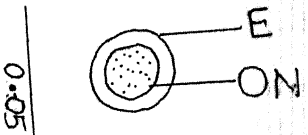



Fig 4

*Jhansiria tikamgarhensis* n.sp. (Female)

Family : Dioecoestidae Southwell, 1930

Subfamily : Dioecocestinae Fuhrmann, 1936

Genus : *Bundelkhandia* n.g.

Species : *Bundelkhandia ruficollis* n.g., n.sp.

(Fig Male 1-4, PP 228 )
(Fig female 1-5, PP 230)

Out of seven little grebs, *Podiceps ruficollis* (Pallas) examined at Gharmau, District Jhansi (U.P.), one was found infected with two cestodes, with single male and single female. Cestodes were present in the intestine of the host. Morphological studies relvealed them to belong to the new genus *Bundelkhandia* of the family Dioecocestidae Southwell, 1930.

*Amended Diagnosis of the family Dioecoestidae*

Completely dioecious. Male with double set of reproductive organs. Female with single set of reprodutive organ. Rostellum bears two rows of rostellar hooks. Testes in single field. Uterus sac like. Eggs with embryonic hooks.

*Bundelkhandia n.g.*

*Generic diagnosis:* Completely diocious form. Rostellum bears two rows of rostellar hooks. Proglottids wider than long. Male with two sets of reproductive organs per proglottid. Armed cirrus present. Cirrus pouch crosses the poral ventral longitudinal excretory canal.

Internal seminal vesicle present. external seminal vesicle absent. Testes numerous in single median group. Ovary horse shoe-shaped. Vitellaria very large, postovarian. Receptaculum seminis near the distal end of vagina. Female genital pores unilateral. Ovary and testees only present in anterior proglottids. Uterus sac like extend beyond the limits of ventral longitudinal excretory canals.Eggs with embryonic hooks. Parasites of podicepediformes.

*Bundelkhandia ruficollis* n.g.,n.sp.

**Male**

Cestodes measures 110 cm in length and 3.991 in maximum width as seen in mature proglottids. Strobila consists of a large number of craspedote and acraspedote, broader than long proglottids.

Scolex measures 0.456x0.656. Suckers unarmed measure 0.096-0.216x0.048-0.144 (0.156x0.096). Armed rostellum longer than broad, protrusible measures 0.420x0.276. Rostellum bears 24 rosteller hooks, arranged in two rows. Each row bears 12 rosteller hooks. Rostellar hooks of first row measure 0.312-0.360 (0.336) and second row measure 0.240-0.264 (0.252) in length.

Neck absent. Immature proglottids measure 0.017-0.068x0.681-1.680 (0.0421x1.180); mature proglottids

measure 0.196-0.315x1.870-3.990 (0.251x2.930).

Male genitalia double. Testes oval to round. 65-95 in number measures 0.012-0.048x0.018-0.054 (0.030x0.036). distributed in one group in anterior half of the proglottids within the limits of ventral longidutinal exccretory canals. Cirrus pouch, club shaped measures 0.170-1.190x0.034-0.187 (0.680x0.110). crosses the ventral longitudinal excretory canals. Cirrus prominent measures 0.170-0.680x0.017-0.170 (0.425x0.093), armed with many rows of spines. Cirrus spines measure 0.006-0.012 (0.009) in length. Internal seminal vesicle measures 0.085-0.255x0.034-0.102 (0.170x0.068), external seminal vesicle absent.

Genital atrium measures 0.048-0.420 (0.168) deep and 0.060-0.324 (0.216) wide. Genital openings bilateral, situated in the anterior half of the proglottid.

Ventral longitudinal excretory canals measure 0.012-0.048 (0.027) in diameter.

FEMALE

Cestode measures 118 cm in length and 3.411 in maximum width as seen in the mature proglottids. All proglottids broader than long. Immature, anterior mature proglottids are acraspedote while posterior mature and gravid proglottids craspedote.

Scolex measures 0.446x0.518. Sucker four, unarmed

measure 0.094–0.132x0.024–0.052 (0.108x0.048). Rostellum longer than broad measures 0.414x0.306. Rostellum bears 28 rostellar hooks, arranged in two rows. Each row bear 14 rostellar hooks. First row of rostellar hooks measure 0.348–0.484 (0.366) in length, divisible into a handle, 0.204–0.222 (0.213); a guard 0.144–0.162 (0.153) and a blade, 0.012–0.018 (0.015) in length. Second row of rostellar hooks measure 0.192–0.240(0.216) in length, divisible into a handle, 0.108–0.126 (0.114); a guard, 0.009–0.012 (0.011) and a blade, 0.090–0.114 (0.102) in length.

Neck absent. Immature proglottids measure 0.017–0.034x0.850–1.190 (0.025x1.020); mature proglottids measure 0.051–0.459x1.36–3.401 (0.255x2.380) and gravid proglottids measure 0.391 – 0.680 x 2.040 – 2.890 (0.535x2.460).

Female genitalia single per proglottid. Ovary measures 0.017–0.301x0.085–0.680 (0.159x0.382), slightly aporal, and lobulated, horse shoe-shaped; overlapping the anterior proglottids. Vitelline gland measures 0.017–0.204x0.034–0.255 (0.110x0.144), pear shaped oostovarian. Vagina differentiated into copulatory and conducting regions. Copulatory region measures 0.136–0.255x0.017–0.051 (0.195x0.034) and conducting region measures 0.017–0.051 (0.034) in

diameter. Receptaculum seminis measures 0.060–0.144x0.024–0.048 (0.102x0.036).

Uterus sac like measures 0.450–0.725x1.801–2.250 (0.487x2.025), crosses the limits of the ventral longitudinal excretory canals. Eggs measure 0.018–0.072x0.018–0.072 (0.045x0.045), onchospheres measure 0.0096–0.029x0.012–0.032 (0.016x0.022). Embryonic hooks measure 0.0048–0.0096 (0.0072) in length.

Dorsal longitudinal excretory canals measure 0.013–0.034 (0.024) in diameter and ventral longitudinal excretory canals measure 0.015–0.034 (0.025) in diameter.

## Discussion

According to Schmidtt, 1986 the cestodes belong to the family Dioecocestidae Southwell, 1930 having completely dioecious nature and double set of reproductive organs in males and *Dioecocestus* Fuhrmann, 1900 and *Neodioecocestus* Siddiqui, 1960.

The present form differs from the genus *Dioecocestus* Fuhrmann, 1900 in having double row of rostellar hooks, presence of suckers, disposition of testes, different shape and location of ovary, different shape and disposition of vitelline glands, unilateral vagina differentiated into copulatory and

conducting regions and simple sac like uterus. From *Neodiecocestus* Siddiqui, 1960 it differs in having presence of rostellum, presence of rostellar hooks, testes in single field and separate female worm.

In the light of above discussion it is proposed to acccommodate the present form as a new genus *Bundelkhandia* n.g. and new species, *Bundelkhandia ruficollis* n.g., n. sp.

Host : *Podiceps ruficollis* (P)

Habitat : Intestine

Locality : Gharmau, Jhansi

Holotype : Department oof Zoology
Bipin Bihari (P.G.) College, Jhansi

Table 24

Comparison of characters of Bundelkhandian.g. with Dioecocestus Fuhrmann, 1900 and NeodioecocestusSiddique, 1960

| | Dioecocestus Fuhrmann, 1900 | Neodioecocestus Siddiqui, 1960 | Bundelkhandia n. g. |
|---|---|---|---|
| Rostellum | Present | Absent | Present |
| Rostellar hooks | Single row | Absent | Double row |
| Suckers | With or without suckers | Present | Present |
| Testes | Numerous in two submedian groups | Numerous in two submedian groups | Numerous in single field |
| Female form | Known | Unknown | Known |
| Ovary | Lobated, transversely elongated, slightly poral | - | Lobulated, horse-shoe shaped, slightly aporal |
| Vitellaria | Isolated, posterodorsal to ovary | - | Compact, postovarian, pear shaped |

| | Dioecocestus Fuhrmann, 1900 | Neodioecocestus Siddiqui, 1960 | Bundelkhandia n. g. |
|---|---|---|---|
| Vagina | Irregularly alternating ending blindly near cuticle | - | Unilateral, vagina differentiated into conducting and copulatory regions |
| Uterus | Strongly lobed sac | - | Uterus sac like extending beyond the limits of ventral longitudinal excretory canals |
| Embryonic hooks | absent | - | present |

## Key to the genera of the family *Dioecocestidae*

1a. Completely dioecious; male with double set of reproductive organs. ....2

1b. Completely or regionally dioecious; male with single set of reproductive organs. ....3

2a. Scolex with armed rostellum ....7

2b. Scolex lacking rostellum or hooks ..*Neodioecocestus*

3a. Uterus horse shoe shaped ....4

3b. Uterus ring shaped ....5

4a. Scolex lacking rostellum or hooks ....*Shipleya*

4b. Scolex with massive rostellum covered with minute spines ...*Echinoshipleya*

5a. Rostellum armed. Strobila completely or regionally dioecious ....*Byrocoelia*

5b. Rostellum unarmed ...6

6a. Completely dioecious testes numerous (65 to 75) vagina present ....*Infula*

6b. Regionally dioecious. Testes few (about 8). Vagina absent ....*Pseudoshipleya*

7a. Scolex with single row of rostellar hooks ....*Dioecocestus*

7b. Scolex with double row of rostellar hooks ...*Bundelkhandia* n.g.

*Bundelkhandia ruficollis* n.g., n.sp.

(Male)

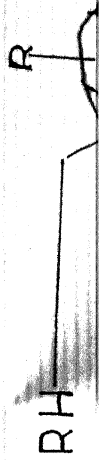
Fig 1 Scolex (5x10)

Fig 2 Rostellar hooks (5x10)

Fig 3 Mature proglottid (5x10)

Fig 4 Cirrus with spines (5x10)

Abbreviations :- B. blade; C. cirrus; CP. cirrus pouch; CS. cirrus spine; G. guard; GA. genital atrium; H. handle; IVS. internal seminal vesicle; R. rostellum; RH. rostellar hook; S. sucker; SC. scolex; T. testes; VLEC. ventral longitudinal excretory canal.



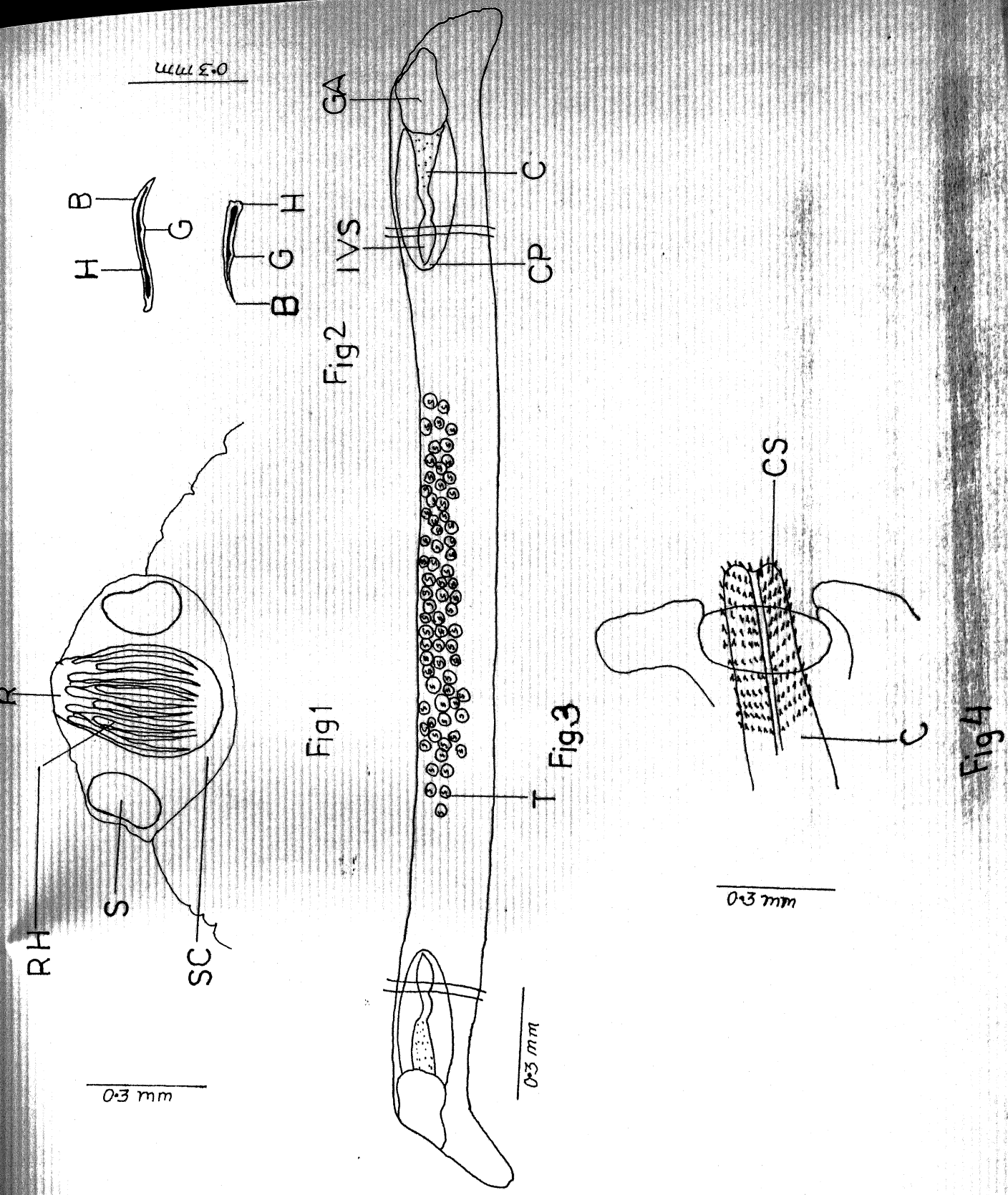



Fig1 Fig2 Fig3 Fig4

*Bundelkhandia ruficollis* n.g., n.sp. (Male)

*Bundelkhandia ruticollis* n.g., n.sp.

(Female)

Fig 1 Scolex (5x10)

Fig 2 Rostellar hooks (10x10)

Fig 3 Mature proglottid (5x10)

Fig 4 Gravid proglottid (5x10)

Fig 5 Egg with embryonic hooks (10x45)

Abbreviations :- B, blade; COR, copulatory region; CR, conducting region; DLEC, Dorsal longitudinal excretory canal; E, egg; EH, embryonic hook; G, guard; H, handle; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook; S, sucker; SC, scolex; U, uterus; VG, vitelline gland; VLEC, ventral longitudinal excretory canal.

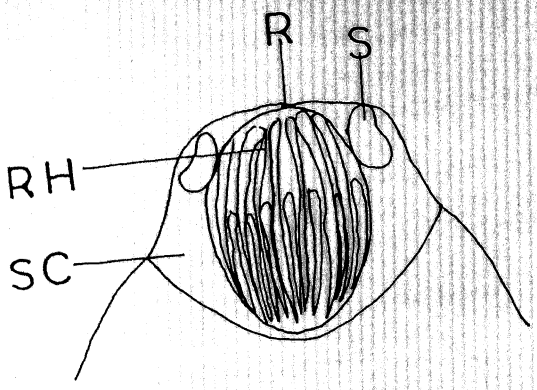



Fig1

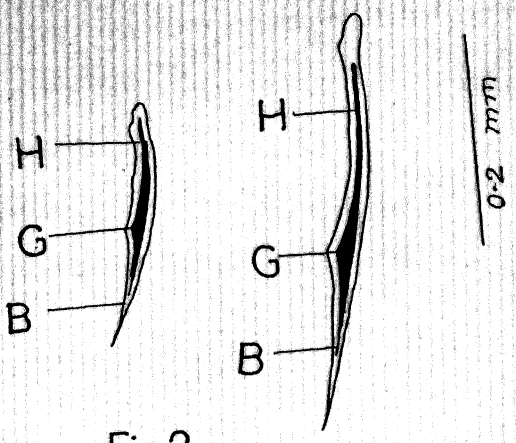



Fig2

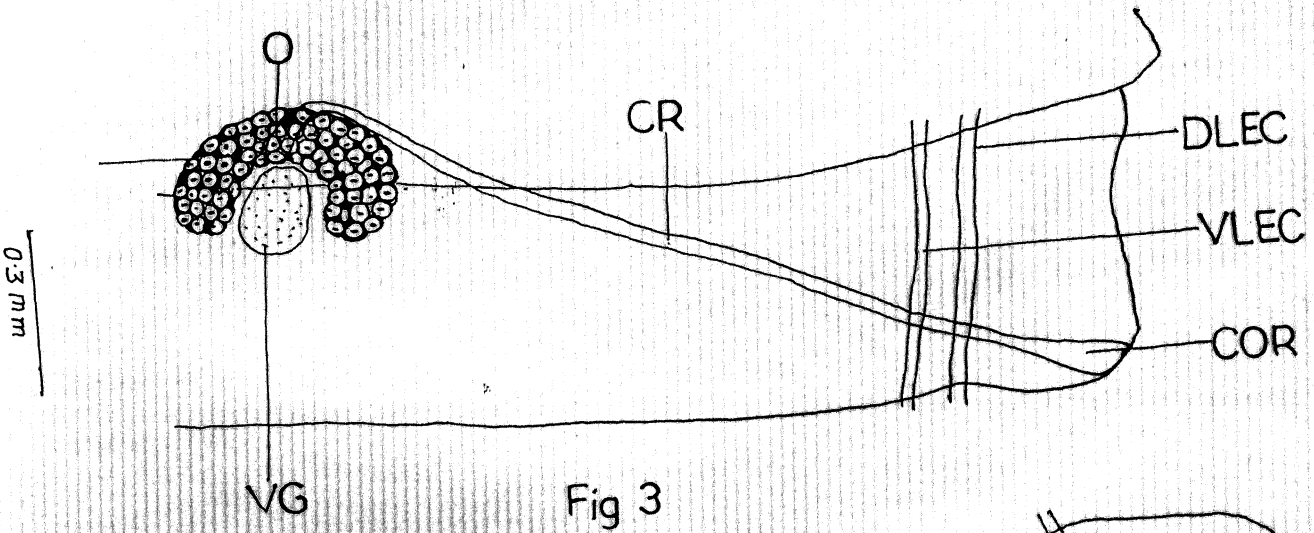



Fig 3

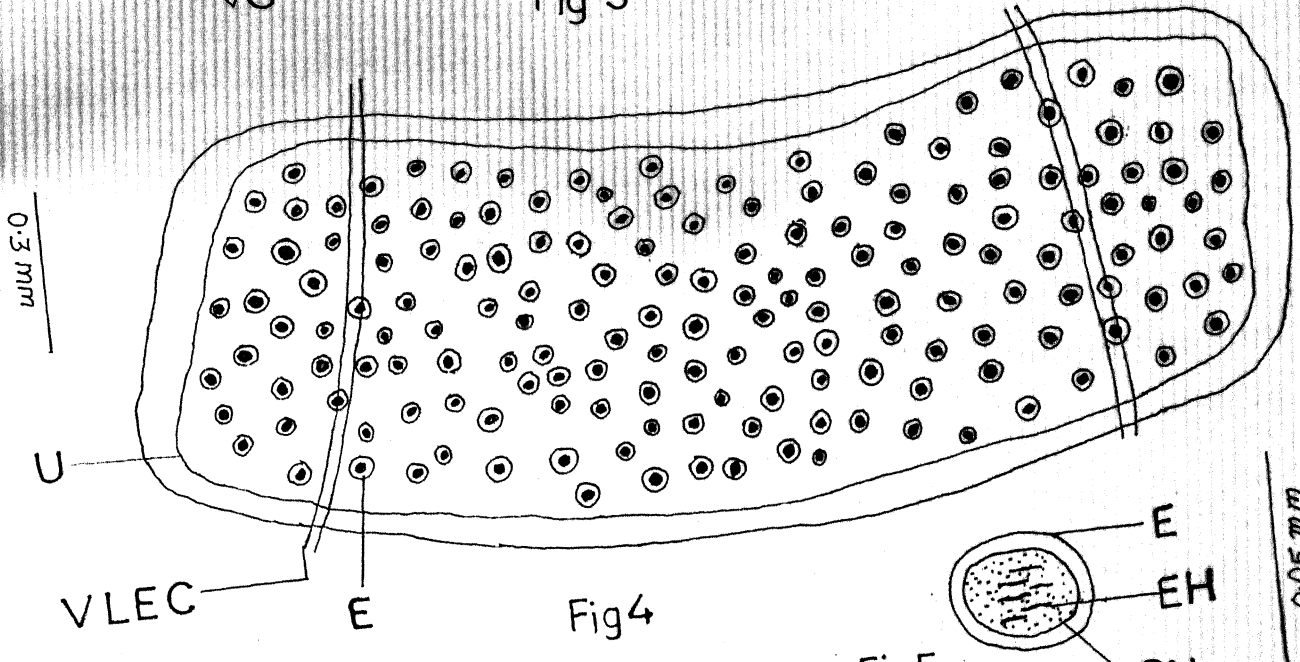



Fig4

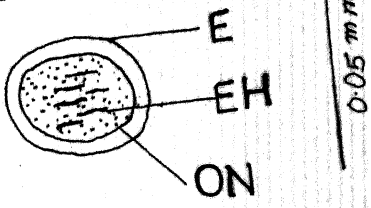



Fig5

*Bundelkhandia ruficollis* n.g., n.sp. (Female)

Family : Dioecocestidae Southwell, 1930

Subfamily : Dioecocestinae Fuhrmann, 1936

Genus : *Diamorphocestus* n.g.

Species : *Diamorphocestus hamirpurensis* n.g., n.sp.

(Fig Male 1–4, PP 239 )
(Fig Female 1–5, PP 241)

Six little grebs, *Podiceps ruficollis* (P) were examined at Hamirpur (U.P.), two were found infected with four cestodes. Each host harbours one male and one female cestode in its intestine. Morphological studies of the cestodes revealed them to belong to the genus *Diamorphocestus* n.g. Subfamily Dioecocestinae Fuhrmann, 1936 and family Dioecocestidae Southwell, 1930.

## *Generic diagnosis*

*Diamorphocestus* n.g.

Large sized worms with two sets of male reproductive organs and one set of female reproductive organs. Cirrus pouch elongated. External seminal vesicle absent. Cirrus armed. Testes numerous in one medial group. Ovary transversely elongated. Vitellaria compact, postovarian. Vagina unilateral. Receptaculum seminis near the distal end of vagina. Uterus simple sac like. Parasites of Podicipediformes.

*Diomorphocestus hamirpurensis* n.g., n.sp.

**Male**

Cestodes measure 80-89 cm in length and 3.571 in maximum width as seen in the mature proglottids. All proglottids broader than long. Immature and anterior mature proglottids acraspedote; posterior mature and gravid proglottids craspedote.

Scolex measures 0.345-0.388x0.548-0.591 (0.367x0.571). Suckers unarmed, oval to round measure 0.078-0.090x0.081-0.096 (0.084x0.089). Rostellum protrusible, longer than broad measures 0.318-0.336x0.338-0.352 (0.327x0.345). Rostellum bears 14-16 rostellar hooks, arranged in single row. Rostellar hooks measure 0.248-0.273 (0.261) in length. Handle, 0.096-0.114 (0.106); blade, 0.144-0.162 (0.153) and guard, 0.012-0.028 (0.020) in length.

Neck absent. Immature proglottids measure 0.013-0.085x0.085-1.531 (0.049x1.191) and mature proglottids measure 0.085-0.365x1.701-3.573 (0.225x2.637).

Male genitalia double. Testes 38-71 in number, distributed in one group within the limits of ventral longitudinal excretory canals. Testes measures 0.021-0.058x0.014-0.068 (0.039x0.041). Cirrus pouch measures 0.061-0.512x0.031-0.176 (0.387x0.104), crosses the ventral longitudinal excretory canal. Cirrus prominent measures 0.328-0.539x0.102-0.280 (0.431x0.191), armed

with 10-15 rows of cirrus spines. Cirrus spines measure 0.0016-0.0032 (0.0024) in length. Internal seminal vesicle measures 0.034-0.255x0.017-0.091 (0.145x0.054). External seminal vessicle absent.

Genital atrium measures 0.017-0.171 (0.144) deep and 0.031-0.255 (0.153) wide. Genital openings bilateral located in the middle of the proglottids margin.

Ventral longitudinal excretory canal measures 0.017-0.034 (0.022) in diameter.

**Female**

Cestodes measure 52-68 in length and 4.335 in maximum width as seen in the gravid proglottids. All broader than long. Immature and anterior mature proglottids acraspedote; posterior mature and gravid proglottids craspedote.

Scolex measures 0.379-0.396x0.728-0.756 (0.388x0.742). Suckers four, unarmed measures 0.084-0.099x0.118-0.127 (0.092x0.122). Rostellum protrusible, longer than broad measures 0.302-0.324x0.288-0.311 (0.313x0.299). Rostellum bears 14-16 rostellar hooks arranged in single row. Rostellar hooks measure 0.214-0.252 (0.233) in length. Handle, 0.120-0.144 (0.132); blade, 0.096-0.108 (0.102) and guard, 0.012-0.026 (0.019) in length.

Neck absent. Immature proglottids measure 0.017-0.051x0.765-1.532 (0.034x1.147); mature proglottids measure 0.051-0.476x1.564-4.259 (0.263x2.909) and gravid proglottids measure 0.306-0.538x2.981-4.335 (0.422x3.658).

Female genitalia single per proglottids. Ovary transverse tube like, slightly poral measures 0.084-0.185x0.085-0.321 (0.109x0.203). Vitelline gland postovarian, compact measures 0.038-0.126x0.039-0.096 (0.080x0.065). Vagina unilateral differentiated into copulatory and conducting regions. Copulatory region measures 0.086-0.276x0.054-0.108 (0.181x0.081) and conducting region measures 0.028-0.039 in diameter. Receptaculum seminis measures 0.043-0.103x0.017-0.052 (0.073x0.035).

Uterus sac like measures 0.208-0.374x3.061-3.817 (0.306x3.439), extend beyond the limits of ventral longitudinal excretory canals. Eggs measure 0.018-0.038x0.018-0.038 (0.028x0.028). Onchospheres measure 0.012-0.025x0.012-0.025 (0.019x0.019). Embryonic hooks measure 0.0121-0.0132 (0.0126) in length.

Ventral longitudinal excretory canals measure 0.036-0.051 (0.044) in diameter.

## Discussion

The present form on the basis of disposition of testes and genital pores differ from the other genera

of the family Dioecocestidae Southwell, 1930 but comes slightly closer to *Dioecocestus* Fuhrmann, 1900.

It differs from *Dioecocestus* Fuhrmann, 1900 in having single group of testes, transversely elongated ovary, uterus simple sac like and vagina unilateral.

In the light of above discussion it is proposed to accommodate the present form as a new genus *Diomorphocestus* and a new species, *Diomorphocestus hamirpurensis* n.g., n.sp.

Host : *Podiceps ruficollis* (P.)

Habitat : Intestine

Locality : Hamirpur (U.P.)

Holotype : Department of Zoology,
Bipin Bihari (P.G.) College, Jhansi

Table-25

Comparison of the characters of the genus closer to Diomorphocestus n.g.

| | Dioecocestus Fuhrmann, 1900 | Diomorphocestus n.g. |
|---|---|---|
| Testes | Divided into two submedian groups | In single group |
| Ovary | Two-winged, multi lobed | transversely elongated |
| Uterus | Transverese tube later with dorsal out growths | Simple sac like |
| Vagina | Alternating irregularly | Unilateral |

## Key to the genera of the subfamily Dioecocestinae Fuhrmann, 1936

1a. Individually dioecious testes divided into two groups, vagina alternate irregularly ...*Dioecocestus*

1b. Individually dioecious testes in single group, vagina unilateral ...*Diomorphocestus* n.g.

*Diamorphocestus hamirpurensis* n.g., n.sp.

(Male)

Fig 1 Scolex (5x10)

Fig 2 Rostellar hook (5x45)

Fig 3 Mature proglottid (5x10)

Fig 4 Cirrus with spines (10x45)

Abbreviations :- B, blade; C, cirrus; CP, cirrus pouch; CS, cirrus spine; G, guard; GA, genital atrium; H, handle; IVS, internal seminal vesicle; R, rostellum; RH, rostellar hook; S, sucker; SC, scolex; T, testes; VLEC, ventral longitudinal excretory canal.

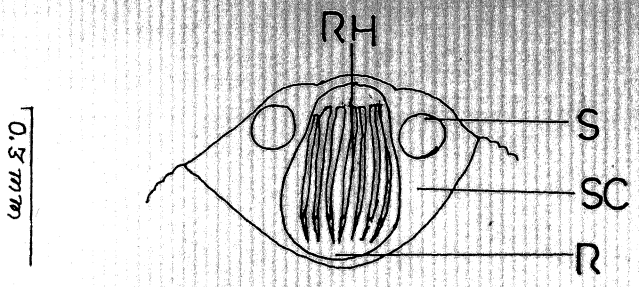



Fig 1

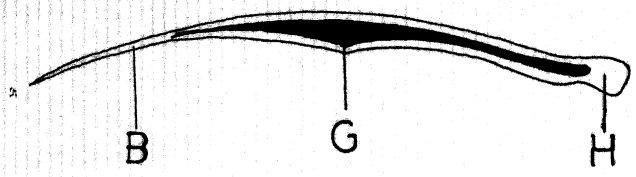
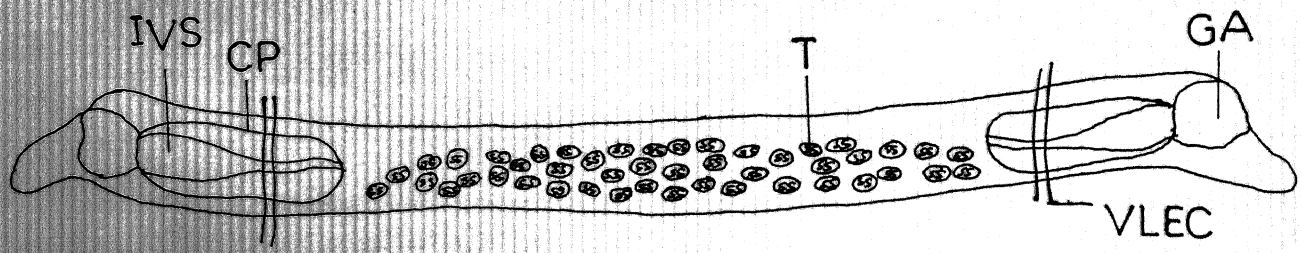



Fig 2

0.05 mm




0.3 mm

Fig 3

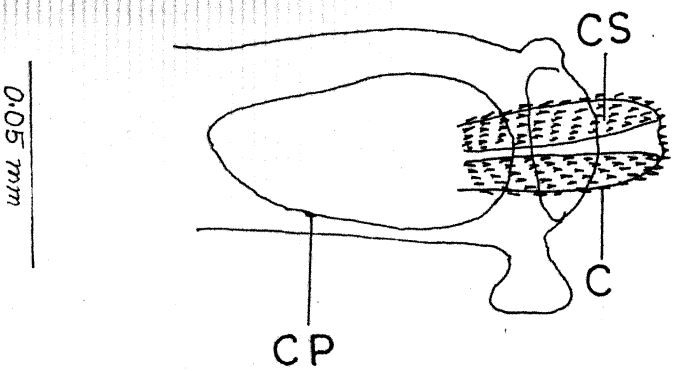



Fig4

*Diomorphocestus hamirpurensis* n.g., n.sp. (Male)

*Diomorphocestus hamirpurensis* n.g., n.sp.

(Female)

Fig 1 Scolex (5x10)

Fig 2 Rostellar hook (5x45)

Fig 3 Mature proglottid (5x10)

Fig 4 Gravid proglottid (5x10)

Fig 5 Egg with embryonic hook (10x45)

Abbreviations :- B, blade; COR, copulatory region; CR, conducting region; E, egg; EH, embryonic hook; G, guard; H, handle; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook; S, sucker; SC, scolex; U, uterus; VG, vitelline gland; VLEC, ventral longitudinal excretory canal.

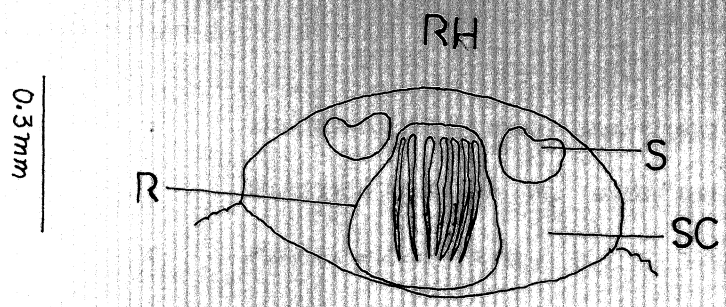



Fig 1

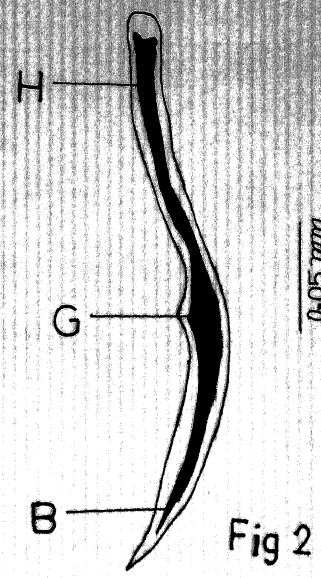



Fig 2

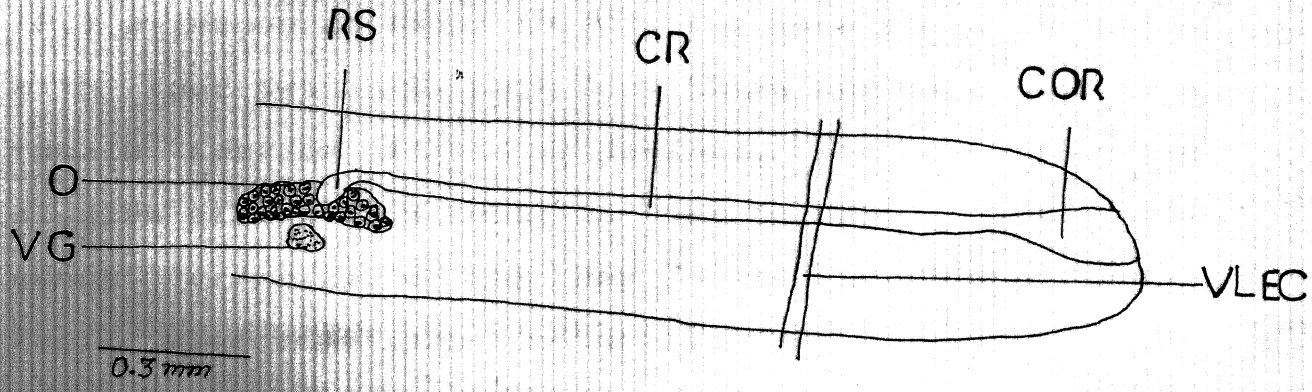



Fig 3

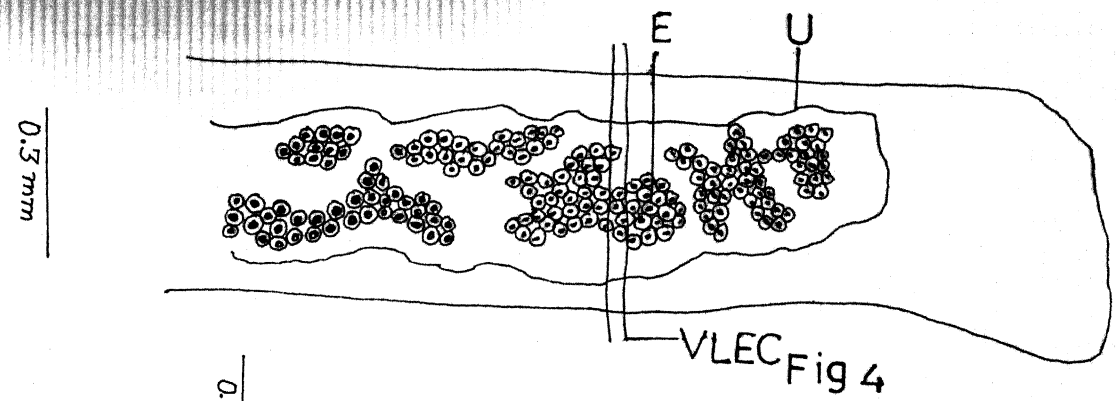



Fig 4

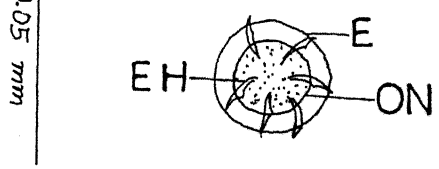



Fig 5

*Diomorphocestus hamirpurensis* n.g., n.sp. (Female)

Family : Dioecocestidae Southwell, 1930

Subfamily : Podiceliinae n. subfam.

Genus : *Podicelia* n.g.

Species : *Podicelia sagarensis* n.g., n.sp.

( Figs. Male 1-4 PP 249 )

( Figs. Female 1-5 PP 251 )

Out of sixteen little grebs, *Podiceps ruficollis* (P.) examined at Sagar (M.P.), two were found infected with four cestodes. Each host bears one male and one female cestode in its intestines. The morphological studies of cestodes revealed them to belong to the new genus *Podicelia* of the new subfamily Podiceliinae: family Dioecocestidae Southwell, 1930.

## *Podicelia* n.g.

### *Generic diagnosis*

Large sized worms, Rostellum with 18-20 hooks, arranged in single row. Proglottids wider than long, craspedote and acraspedote. Male with two sets of reproductive organs per proglottid. Testes disappear on posterior proglottids. Cirrus pouch oblique, crosses the ventral longitudinal excretory canals. Internal seminal vesicle present. Cirrus armed. Testes numerous in single field; some testes overlapping on another proglottid. Female genitalia single. Ovary horse shoe-

shaped. Vitelline gland postovarian. Vagina opens through vaginal pore. Vaginal pores unilateral. Receptaculum seminis near the distal end of vagina. Uterus annular. Parasite of aquatic birds.

*Podicella sagarensis* n.g., n.sp.

**Male**

Cestodes measure 120-144 cm in length and 2.721 in maximum breadth as seen in the mature proglottids. All proglottids broader than long. Anterior immature and mature proglottids acraspedote; posterior mature proglottids craspedote.

Scolex measures 0.228-0.265x0.348-0.411. Suckers four, unarmed, oval to round measure 0.084-0.108x0.060-0.096 (0.096x0.078). Rostellum longer than broad measures 0.372-0.408x0.156-0.192 (0.390x0.174). Rostellum bears 18-20 rostellar hooks, 0.120-0.131 (0.126) in length. Handle, 0.060-0.066 (0.063); blade, 0.058-0.063 (0.060) and guard, 0.0043-0.0058 (0.0051) in length.

Neck absent.Immature Proglottids measure 0.0129-0.068x0.334-0.344 (0.041x0.429); mature proglottids measure 0.119-0.850x0.644-2.721 (0.484x1.683).

Male genitalia bilateral. Testes 50-84 (63) in number, oval to round, in single field in the anterior half of the proglottid measure 0.024-0.054x0.024-0.054

(0.039x0.039). Testes overlaping the preceding proglottids. Cirrus pouch measure 0.204-0.850x0.119-0.265 (0.527x0.192), obliquely elongated, overlapping the anterior proglottids and crosses the ventral longitudinal excretory canals. Cirrus measures 0.081-0.511x0.048-0.370 (0.296x0.209). Cirrus armed with 9-23 rows of spines measuring 0.0029-0.0114 (0.072) in length. Internal seminal vesicles measure 0.088-0.184x0.038-0.081 (0.136x0.061). External seminal vesicle absent.

Genital atrium measures 0.115-0.330 (0.214)width and 0.068-0.204 (0.136) depth. Genital openings bilateral, located in the anterior half or middle of the proglottids margin.

Ventral longitudinal excretory canals measure 0.012-0.051 (0.032).

Female

Cestodes measure 111.2-115 cm in length and 4.420 in maximum breadth as seen in the gravid proglottid. All proglottids broader than long. Anterior immature and mature proglottids acraspedote; posterior mature and gravid proglottid craspedote.

Scolex measures 0.294-0.310x0.515-0.545. Suckers four, oval to round, unarmed measure 0.138-0.145x0.061-0.109 (0.085x0.105). Rostellum longer than broad measures 0.476-0.564x0.224-0.266 (0.520x0.245).

Rostellum bears 18-20 rostellar hooks, arranged in single row. Rostellar hooks measure 0.122-0.156 (0.139) in length. Handle, 0.084-0.096 (0.090); blade, 0.048-0.060 (0.054) and guard, 0.014-0.024 (0.019) in length.

Neck absent. Immature proglottids measure 0.012-0.048x0.491-0.682 (0.031x0.587); mature proglottids measure 0.374-0.765x0.761-3.064 (0.569x1.912) and gravid proglottids measure 0.511-1.275x3.231-4.429 (0.892x3.825.

Female genitalia single per proglottids. Ovary horse shoe-shaped, slightly poral on anterior half of the proglottid measures 0.041-0.425x0.255-0.816 (0.233x0.535). Vitelline gland postovarian measures 0.108-0.204x0.017-0.173 (0.156x0.095). Vagina measures 0.012-0.030 (0.021) in diameter. Receptaculum seminis measures 0.049-0.112x0.034-0.068 (0.086x0.051).

Vaginal pore measure 0.036-0.108(0.072) deep and 0.012-0.096 (0.054) wide. Vaginal pores unilateral located in anterior half of the proglottid margin.

Uterus sac like measures 0.681-0.765x2.543-3.511 (0.723x3.027), extend beyond the limits of ventral longitudinal excretory canals. Eggs measure 0.024-0.041x0.022-0.048 (0.035x0.037). Onchospheres measure 0.012-0.031x0.012-0.031 (0.024x0.024).

Ventral longitudinal excretory canals measure 0.012-0.029 (0.020) in diameter.

## Discussion

The present form differs from subfamily Dioecocestinae Fuhrmann, 1936 in having annular uterus with out opening and vagina with prominent vaginal pore. From subfamily Gyrocoeliinae Yamaguti, 1959 it differs in having individually dioecious worms, male with double sets of reproductive organs and female with a single set of reproductive organs, prominent unilateral vagina with vaginal pore.

In the light of above discussion it is proposed to accommodate the present form in a new sub family Podiceliinae type new genus, *Podicelia* and new species, *Podicelia sagarensis* n.g., n. sp.

Host : *Podiceps ruficollis* (P)

Habitat : Intestine

Locality : Sagar (M.P.)

Holotype : Department of Zoology, Bipin Bihari (P.G.) College, Jhansi

## Key to sub families of Dioecocestidae

Individually dioecious; male with a double set of reproductive organs; uterus a transverse tube; vagina alternating irregularly without vaginal pore. ... Dioecocestinae

Individually or regionally dioecious; male and female with a single set of reproductive organs; uterus annular, with or without openings; vagina alternating regularly or irregularly without pore or absent ...Gyrocoeliinae

Individually dioecious; male with a double set of reproductive organs; uterus annular, vagina unilateral with prominent pore ...Podicelliinae
Type genus
*Podicella* n.g.

*Podicella sagarensis* n.g., n. sp.

(Male)

Fig 1 Scolex (5x10)

Fig 2 Rostellar hook (5x45)

Fig 3 Mature proglottis (5x10)

Fig 4 Cirrus with spines (10x10)

Abbreviations :- B, blade; C, cirrus; CP, cirrus pouch; CS, cirrus spine; G, guard; GA, genital atrium; H, handle; IVS, internal seminal vesicle; R, rostellum; RH, rostellar hook; S, sucker; SC, scolex; T, testes; VLEC, ventral longitudinal excretory canal.

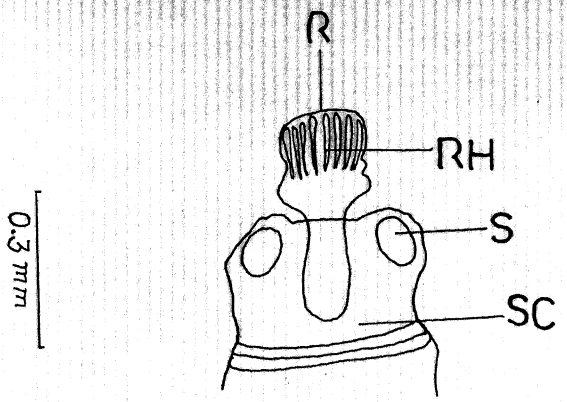



Fig1

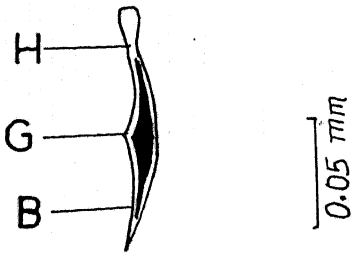



Fig 2

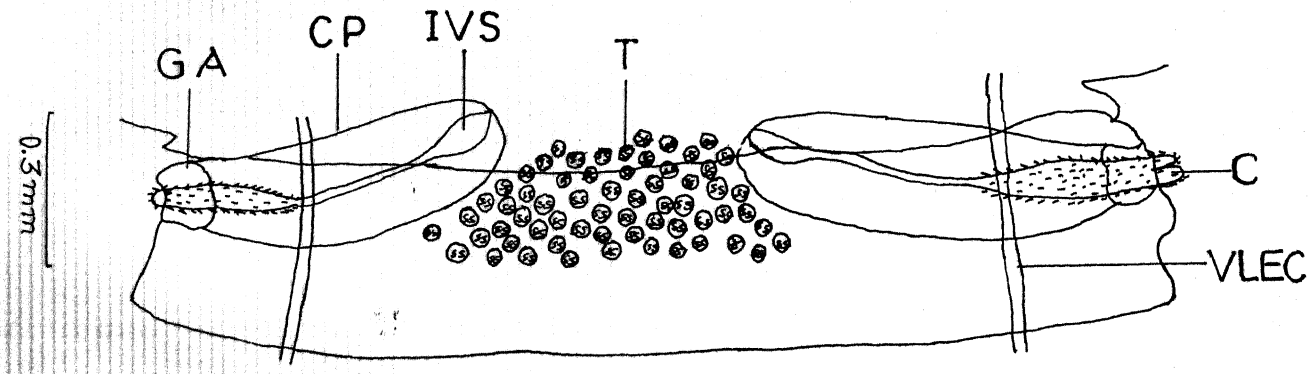



Fig 3

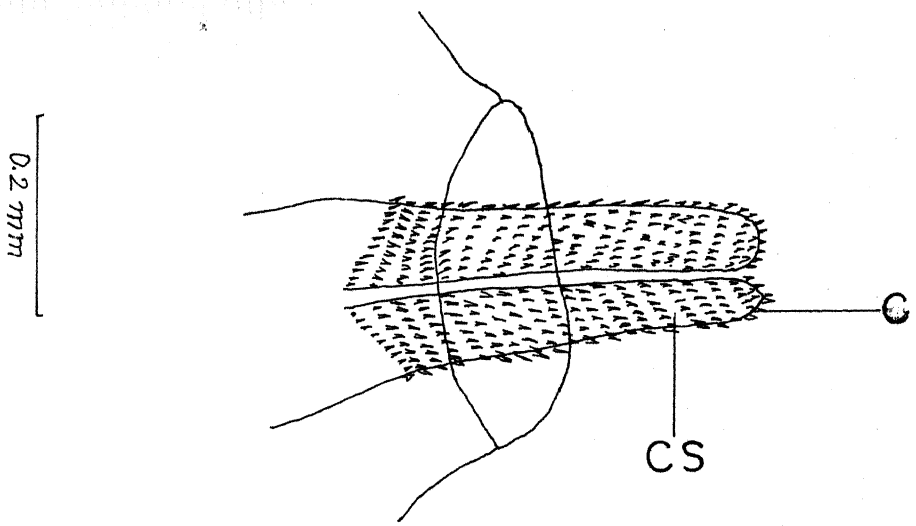



Fig 4

*Podicelia sagarensis* n.g., n.sp (Male)

*Podicelia saoarensis* n.g., n. sp.

(Female)

Fig 1 Scolex (5x10)

Fig 2 Rostellar hook (5x45)

Fig 3 Mature proglottid (5x10)

Fig 4 Gravid proglottid (5x10)

Fig 5 Egg (5x45)

Abbreviation :- B, blade; E, egg; G, guard; H, handle; O, ovary; ON, onchospheres; R, rostellum; RH, rostellar hook; RS, receptaculum seminis; S, suckers; SC, scolex; U, uterus; V, vagina; VG, vitelline gland; VLEC, ventral longitudinal excretory canal.

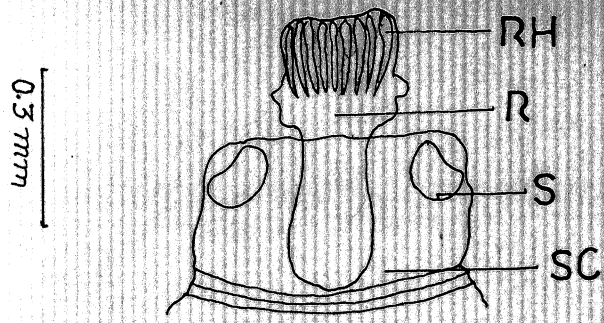



Fig 1

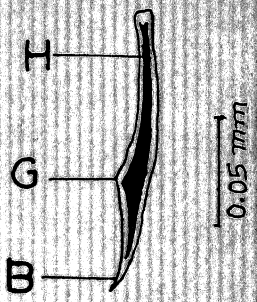



Fig 2

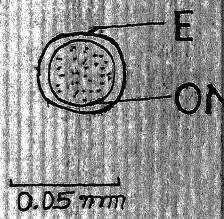



Fig 5

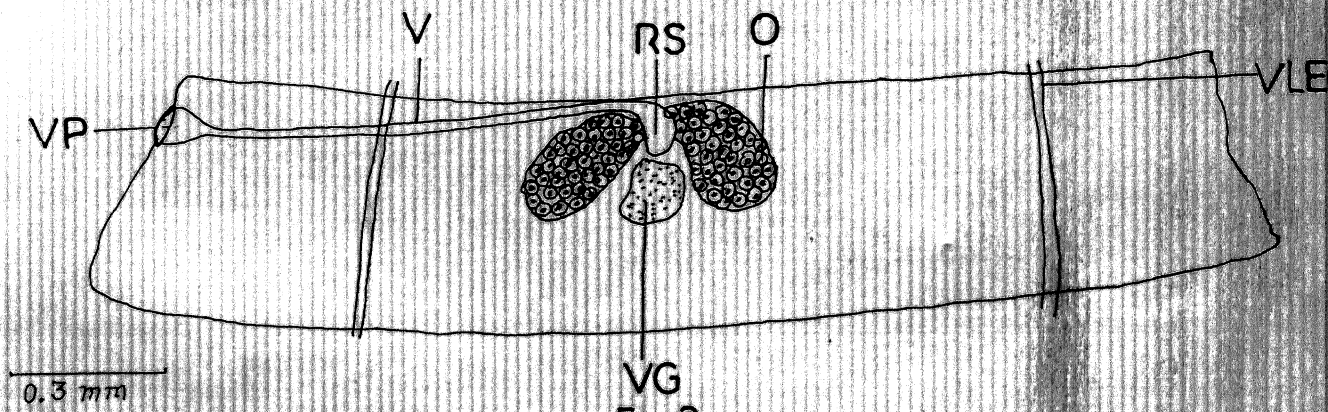



Fig 3

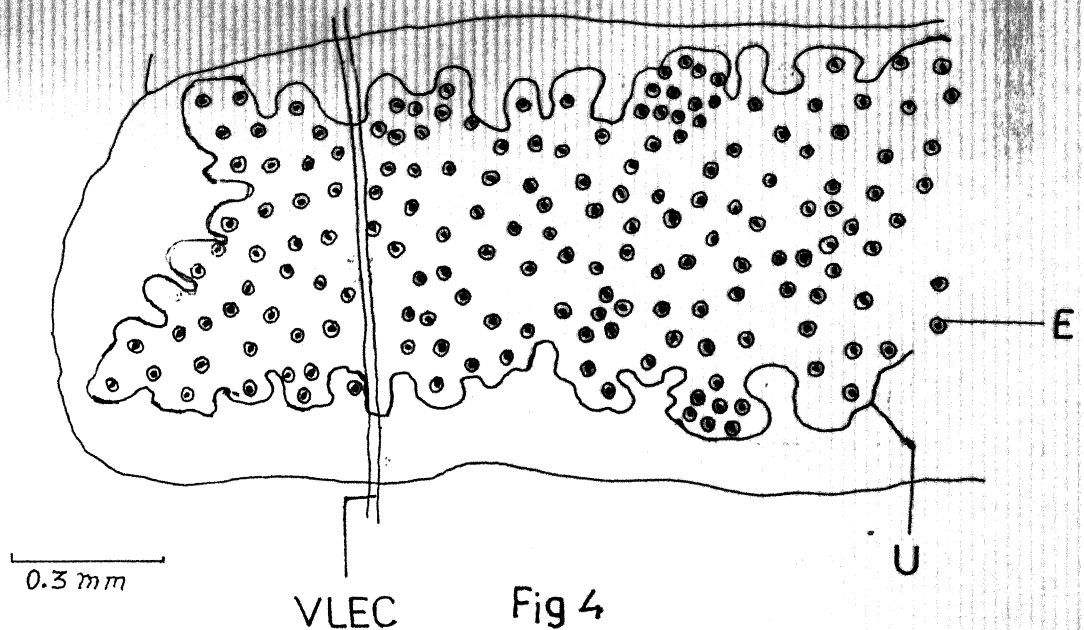



Fig 4

*Podicelia sagarensis* n.g., n.sp. (Female)

# PART - G

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N. B. Some references have not been seen in original